National Aeronautics and
Space Administration
Ames Research Center
Moffett Field, California 94035

NASA

The Astrogram

VOLUME XIX NUMBER 7

January 13, 1977

NASA to select new astronauts

You won't find the notice in the want ad section of your newspaper, but NASA is recruiting for astronauts.

However, the jobs are off in the future a bit. Applications from candidates will be accepted until June 30, 1977 and selection will be made by December 1977.

And you don't necessarily have to be a pilot either, for these jobs will be aboard the Space Shuttle, the reusable space transportation system of the 1980s.

The Shuttle will, of course, need pilots but it will also need scientists and other workers to serve on the orbiting spacecraft.

At least 15 pilot candidates and 15 mission specialist candidates will be selected to report to the Lyndon B. Johnson Space Center, Houston, Tex., on July 1, 1978, for 2 years of training and evaluation. Final selection as an astronaut will depend on satisfactory completion of the evaluation period.

NASA is committed to an affirmative action program with a goal of having qualified minorities and women among the newly selected astronaut candidates. Therefore, minority and women candidates are encouraged to apply.

Military personnel should apply through their respective military departments using procedures which will be disseminated later this year by DOD. Military candidates will be detailed to JSC but will remain on active military status for pay, benefits, leave and other military matters.

There are currently 31 persons available as Space Shuttle crewpersons, including nine scientists. Twenty-eight of them are astronauts assigned to the Johnson Space Center and three hold government positions in Washington, D.C.

Crews will consist of as many as seven people – commander, pilot, mission specialist and up to four payload specialists who will operate payload equipment.

Requirements for applicants are:

Pilot applicants must have a bachelor's degree from an accredited institution in engineering, physical science or mathematics or have completed all requirements for a degree by Dec. 31, 1977. An advanced degree or equivalent experience is desired. They must have at least 1,000 hours first pilot time, with 2,000 or more desirable. High performance jet aircraft and flight test experience is highly desirable. They must pass a NASA Class I space flight physical. Height between 64 and 76 inches is desired.

Applicants for mission specialist candidate positions are not required to be pilots. Educational qualifications are the same as for pilot applicants except that biological science degrees are included. Mission specialist applicants must be able to pass a NASA Class II space flight physical. Height between 60 and 76 inches is desired.

Pay for civilian candidates will be based on the Federal Government's General Schedule pay scale from grades GS-7 through GS-15, with approximate salaries from $11,000 to $34,000 per year. Candidates will be compensated based on individual academic achievements and experience. Other benefits

(Continued on Page 4)

Pioneer 10 displayed in the Smithsonian

An engineering test model Pioneer 10, the first spacecraft to reach the giant planet Jupiter, was put on display in the National Air and Space Museum of the Smithsonian Institution, Washington, D.C., on Monday, Jan. 10.

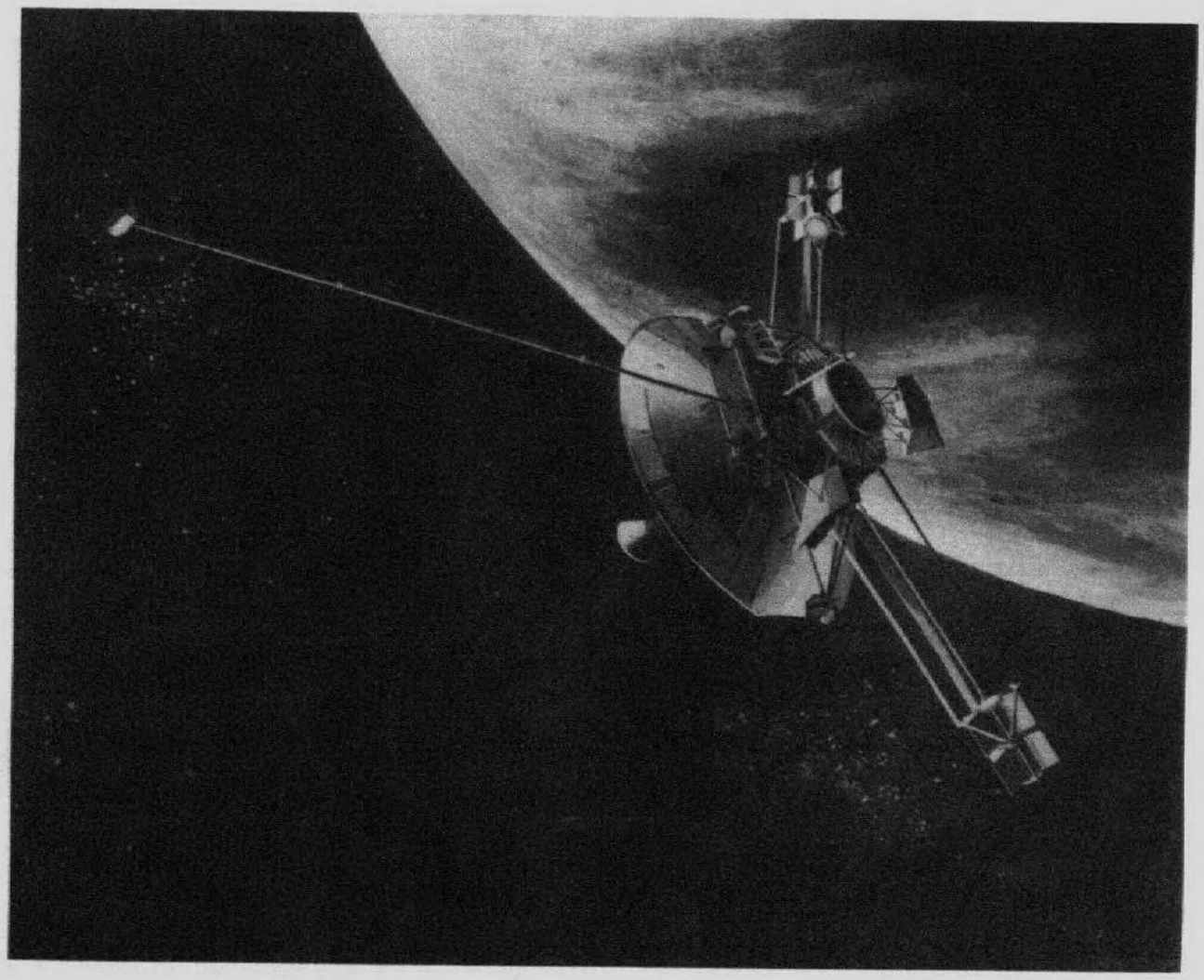
Pioneer will join Apollo 11, the Wright Brothers' Flyer and Lindbergh's Spirit of St. Louis in the Smithsonian's Milestones of Flight Hall.

Speakers at the brief dedication ceremony at the Air and Space Museum were Dr. James C. Fletcher, NASA Administrator; Charles F. Hall, Pioneer Project Manager; Adolph Thiel, Senior Vice President, TRW; Michael Collins, Apollo 11 Astronaut and Director of the museum; and Dr. John Wolfe, Pioneer Project Scientist. Guests included members of Congress, representatives from NASA field centers, NASA Headquarters, and the Energy Research and Development Administration.

Pioneer 10 made the first visit to Jupiter in December 1973, and discovered that the enormous planet is a huge whirling ball of liquid hydrogen, with no perceptible surface. Pioneer also returned the first closeup view of the colorful planet with its huge red eye, and of two of its four planet-sized moons. It made a variety of discoveries about Jupiter's magnetic field, radiation belts and weather. Findings about the latter should help shed more light on the difficult problems of Earth's highly unstable weather and climate.

Pioneer 10's twin spacecraft, Pioneer 11, identical to the spacecraft being placed in the Smithsonian, is now making the first trip to Saturn. Pioneer 11 added greatly to Jupiter's knowledge by taking the first look at the planet's polar regions (not visible from Earth), and the first closeup pictures of two of the four large Jovian moons.

Pioneer 11 surpassed Pioneer 10's record flyby speed of 131,000 km (82,000 mi) per hour, reaching a speed of 171,000 km (107,000 mi) as it passed the planet in December 1974. A few weeks ago, following its Jupiter-Saturn flightpath, 160 million km (100 million mi) above the plane containing the planets, Pioneer 11 discovered the structure of the Sun's magnetic field, a find which may have a major impact on particle physics, with its many effects on man; and on understanding the billions of Sun-like stars in the universe, suggesting a relatively simple internal structure for Sun and stars.



New search capability at Ames libraries

A powerful new key to the literature of science and technology is now available to NASA Ames Research Center employees at the Library Branch. It is Lockheed's DIALOG on-line information system. Using techniques closely related to those used in operating NASA's own in-house retrieval system, RECON, the Library staff can search 50 data bases containing references to material of value to almost every research program at Ames.

Of the data bases, the following have been of greatest interest:

BIOSIS PREVIEWS contains citations from both *Biological Abstracts* and *Bioresearch.* (1972 – present)

CA CONDENSATES is the computer-readable file corresponding to the printed *Chemical Abstracts*. (1970 – present)

COMPENDEX is the machine-readable version of the Engineering Index. (1970 – present)

INSPEC-PHYSICS includes physics abstracts and *INSPEC-ELEC & COMPUT* includes electrical and electronics abstracts and computer and control abstracts. (1969 – present)

ISMEC abstracts significant articles of interest in mechanical engineering. (1973 – present)

METADEX includes *Metals Abstracts* and *Alloys Index*. (1966 – present; *Alloys Index* from 1974)

NTIS data base consists of government-sponsored research, development, and engineering reports from agencies such as DDC, ERDA, and DOT. (1964 – present)

PSYCHOLOGICAL ABSTRACTS covers the world's literature in psychology and related behavioral sciences. (1967 – present)

SCISEARCH is a multidisciplinary index to the literature of science and technology. It contains all the material published in *Science Citation Index* and additional records from the *Current Contents* series of publications not included in the printed edition of *SCI*. (1974 – present)

Through NASA Headquarters' System Development Corporation Search Service, Ames Libraries also can give NASA employees access to additional machine-retrievable data bases. Of particular interest are:

GEOREF an index to the geosciences produced by the American Geological Institute. (1967 – present)

SSIE ON-LINE SEARCH SERVICE the Smithsonian Science Information Exchange's registry of information on research in progress throughout the United States. (July 1974 – present)

If there is a machine literature search in your future, drop by the library or give it a call. (Main Library, ext. 5157; Life Sciences Library, ext. 5387).

Leslie Whitaker demonstrates new system.

Shuttle booster contract awarded

NASA has selected United Space Boosters, Inc. (USBI) of Sunnyvale (a wholly-owned subsidiary of United Technologies Corp.), as the assembly contractor for the Space Shuttle Solid Rocket Booster (SRB).

A cost-plus-award-fee contract has been negotiated for $122 million which includes the maximum potential award fee. The contract is for six design, development, test and evaluation (DDT&E) flights which extend through March 1980 plus options for 21 operational flights extending into 1982.

The booster assembly contract covers all necessary activities at Marshall Space Flight Center and Kennedy Space Center, Fla.

The first of six orbital flight tests is scheduled for the second quarter of 1979 and operational flights begin in 1980.

USBI will be responsible to the Marshall Center for assembly, checkout and refurbishment of the boosters and to Kennedy Center for final assembly, stacking, integrated checkout, launch operations and post-launch disassembly of the boosters.

The Space Shuttle is to be launched using its three main engines and two boosters operating together. The boosters, upon burnout at an altitude of about 43.5 km (27 mi), will be separated and will descend by parachute to the ocean for retrieval and reuse. The Space Shuttle boosters are designed for use 20 times.

Also in competitive negotiations for the contract were McDonnell Douglas Astronautics Co., Huntington Beach and Boeing Services International, Seattle.

AMRDL employees honored

Five members of the U.S. Army Air Mobility R&D Laboratory (AMRDL), received special recognition from the Laboratory Director, Dr. Richard M. Carlson, during special ceremonies held in December at the Laboratory Headquarters, Ames Research Center, Moffett Field, California.

L to R: Dr. Carlson; (back row) Lorraine C. Vernon, Personnel Management Specialist who received a Quality Step Increase; George K. Merchant, Chief, Policy, Plans, and Programs Office, received a certificate for accumulating 2,000 hours sick leave; Mike Kodani, Program Analyst, received a pin and certificate for 10 years federal service; and (front row) Calvin Lee, Program Analyst, received a certificate for accumulating 1,000 hours sick leave and Beverley McDaris, Management Assistant, Personnel Services Office, was cited for her Outstanding Performance.

Vikings resume activity on Mars

Viking spacecraft have resumed activity on Mars after a month-long hibernation resulting from the Sun's partial blackout of Viking-to-Earth communications.

The first of a series of radio commands to the spacecraft was sent early this week, ordering the Viking Orbiters to resume photographic and infrared coverage of the planet's surface. On Thursday and Friday, December 16 and 17, the first commands were scheduled to be sent to the two Viking landers, ordering them to continue gathering Mars data at a low rate until January and to begin playback on December 20 of the data gathered during the blackout period. These data include limited photographs of the area around the two landers, weather data, inorganic chemical analysis data, data to support the so far unsuccessful search for Mars quakes using the seismometer on Lander 2, and continued biology data.

The resumption of activity marks the beginning of Viking's 18-month "extended mission," during which a variety of experiments will be conducted. These include:

- Taking more photographs, temperature observations and water vapor measurements of the Martian surface and polar regions, some of these at twice the resolution of previous observations.
- Scooping up more soil samples for life detection tests and inorganic chemical analysis.
- Monitoring for seismic events
- Observing the planet's daily and seasonal weather changes
- Taking the closest pictures yet of Mars' two tiny moons, Phobos and Deimos
- And watching for any evidence of the beginnings and development of possible planetwide dust storms.

These are the highlights of Viking activity over the next few months, according to Mission Director G. Calvin Broome at the Jet Propulsion Laboratory, control center for Viking:

- On December 20, the orbit of Viking Orbiter 2 will be changed to lower the point of closest approach to Mars from about 1500 km (930 mi) to 800 km (480 mi). The inclination of the orbit will also be increased from 75 degrees to 80 degrees. This combination of changes will provide much more detailed viewing of the formation of the North polar hood and ice cap as winter approaches in the Northern hemisphere. As summer approaches in the southern hemisphere, the scientists also will watch the recession of the South polar hood. These data will contribute greatly to our understanding of the atmosphere and surface of Mars.
- Viking Orbiter 1 will continue photographing several areas of the planet, as well as conducting infrared thermal mapping and atmospheric water detection measurements throughout the Martian day and night.
- Biology experiments on both landers will continue, with fresh soil to be delivered in late January and February. Inorganic chemical analyses of fresh soils will continue, with emphasis on acquiring Martian pebbles for inorganic analysis, a feat not accomplished during earlier mission phases.
- Both Viking landers will continue monitoring the dunes around the spacecraft and the Mars wind speed and direction, searching for evidence of the onset of a dust storm. Viking scientists are apprehensive over the possibility of a planetwide dust storm because Mars will, in the spring of next year, be nearing perihelion (closest approach to the Sun), a condition believed to play a role in triggering such storms. At the time of the arrival of Mariner 9 at Mars in 1971, the entire planet was engulfed in the most massive dust storm in the history of Mars observations. The density of the dust severely limited observations from orbit for a period of several months after the arrival of the Mariner spacecraft. Another such storm, even if considerably less severe, would make Viking observation from orbit difficult and could endanger the lander.
- In February, Viking Orbiter 1 will be directed to make a close approach to the Martian moon Phobos, taking pictures and making thermal measurements from as close as 50 km (30 mi). The photographs will show features on the moon as small as a few feet across.

Viking 1 landed on Mars to conduct a detailed scientific examination of the planet – including a search for life – on July 20. Viking 2 landed on September 3. To date, the results of the life-seeking experiment have been puzzling. They neither prove nor disprove the existence of life on Mars.

The Viking-extended mission is designed to permit scientific observations through an entire Martian year of 25 months.

Traveling by air? Watch those matches!

Recently, the Department of Transportation issued this press release:

"The Federal Aviation Administration recently warned air travelers that it both is dangerous and illegal to carry loose book matches in their luggage.

"The agency said the matches could ignite in a suitcase and start a smoldering fire that could ruin traveler's personal belongings. Moreover, there always is a danger of a small fire becoming a large one or triggering an explosion on an aircraft in flight.

"Persons who carry loose book matches in their carry-on or checked luggage also are subject to fines for carrying hazardous materials on board an aircraft in violation of FAA regulations.

"The penalty for violation of the regulation is a fine of up to $10,000. If criminal intent can be proved, the maximum penalty is a $25,000 fine, five years in prison, or both."

ARA ACTIVITIES

CHILDREN'S CHRISTMAS PARTY – Over one thousand children came to this year's Christmas party along with their parents and enjoyed gifts, balloons, clowns, marionette shows, carollers and a visit with Santa and Mrs. Claus as well as refreshments and a "moon walk." None of this would be possible without the many volunteers who help each year to put this party together. The ARA Executive Board received the following message from Dr. Mark which we would like to pass along to all of you.

"I am very pleased to have this opportunity to thank all of those who participated in this year's Ames Christmas Party. The annual Christmas party is an important event for the Center and we all appreciate the work done by those who organized it and prepared for it. All of us who attended the party enjoyed the party very much and it was obvious that much planning and hard work went into making it successful." – *Hans Mark*

Our special thanks also to:

- The Raffle Ticket sellers,
- Santa and Mrs. Claus, Bob Gaines and Barbara Fuller,
- The workmen who spent many hours transforming the Hangar into Santa's Village,
- All the volunteer entertainers, clowns, puppeteers, gift wrappers, and givers,
- Our helicopter pilot who delivered Santa and Mrs. Claus safely to the Hangar door,
- And last but not least, all those who helped clean up afterwards.

Jetsetter news

15–22 May 1977 – THE CRUISE . . . A CARIBBEAN ADVENTURE

One exciting week on the TSS Mardi Gras – one of the biggest and most complete cruise ships sailing from Miami.

* 8 Cocktail Lounges, Nightclubs and/or bars
* 4 to 5 Bands
* 3 Rooms with 3 kinds of dancing
* 3 Swimming Pools – 2 Outdoor/1 indoor

Everything's included. Roundtrip air from San Jose or San Francisco, transfers, taxes, cruise, parties . . . and all the fun!

All this and more for a starting price of $599. What a value!

Don't miss out on this exciting adventure.

Avoid Disappointment – Book Now!

A Cruise presentation will be given in the Space Sciences Auditorium on 2 Feb. 77, starting at 7:30 p.m. Films will also be shown at the Happy Hour in the Cafeteria on 18 Feb 77. PLAN TO BE AT ONE OF THE PRESENTATIONS.

Certified Engineering Technician Exam

Electrical and Electronic Engineering Technicians should begin preparing for the May, 1977 Certified Engineering Technician (CET) examination sponsored by the National Society of Professional Engineers. The 6-hour examination covering mathematics, physical science, and basic engineering principles as well as electrical and electronic engineering is open only to engineering technicians. Graduates of 4-year engineering programs may not take the exam.

The CET License is recognized nationally; recertification is not necessary when moving to another state. Certification as an Engineering Technician is the only official recognition of ability, achievement, and professionalism available to ET's. Certification is required by many employers of Electrical Engineering Technicians, and may enable ET's to bypass company employment examinations.

In addition to Electrical Engineering Technicians, certification is strongly recommended for supervisors of ET's, quality assurance inspectors, testers, and troubleshooters working with electrical, electronic, and electro-mechanical devices.

For more information on the CET License, applications, and review courses for the exam, contact: Michael R. Lindeburg, P.E., Program Director, Professional Engineering Registration Program, P.O. Box 911, San Carlos, CA 94070. (415) 593-9731.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date

NONE

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-21	Aerospace Engineer	FSN	Ronald Hess
76-147T	Supervisory High Altitude Aircraft Facility Manager	SEH	Cancelled

Employee organizations

Each Federal Agency is required to advise its employees periodically of their rights under Executive Order 11491, Labor Management Relations in the Federal Service.

The Order provides that each employee has the right, freely and without fear of penalty or reprisal, to form, join, and assist a labor organization or to refrain from any such activity, and each employee shall be protected in the exercise of this right. The right to assist a labor organization extends to participation in the management of the organization and acting for the organization in the capacity of an organization representative.

Employees who are supervisors or other management officials may belong to a labor organization, but they may not represent the organization or participate in the management of it. Supervisors or managers are not included in a unit for which a labor organization holds exclusive recognition. At Ames, Local 997, National Federation of Federal Employees, is the exclusive bargaining agent for:

- All Wage Grade employees, less supervisors, and less those Wage Grade employees in the Model Development Branch;
- All General Schedule clerical and technical employees in NASA occupational codes 300 and 500, excluding management officials, supervisors, professional employees, and those employees engaged in Federal personnel work in other than a purely clerical capacity.

The Pattern Maker's Association is the bargaining agent for the nonsupervisory wage grade employees in the Model Development Branch.

Evening teaching positions available

Engineers are needed to teach review courses for the November Professional Engineering exams in Chemical, Quality, and Nuclear Engineering. The courses are part of the Professional Engineering Registration Program directed by Michael R. Lindeburg, P.E., and are sponsored by the Peninsula Chapter of the California Society of Professional Engineers.

Each course will be taught entirely by one engineer, meeting 3 hours a week over 13 weeks in Menlo Park, starting in early August.

Contact: P.E. Registration Program, P.O. Box 911, San Carlos, CA 94070. (415) 593-9731.

New astronauts

(Continued from Page 1)

include vacation and sick leave and participation in the Federal Government retirement, group health and life insurance plans.

Potential users of the Space Shuttle include government agencies and private industries from the United States and abroad.

NASA
National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035
AC 415 965-5000

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Want ads

Transportation

FOR SALE: 1973 Yamaha – 360 MX, $190. Needs engine work, transmission perfect. Call after 6, 253-2687.

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1972 Buick Skylark Custom, V8, PS, AT, AC, 75K mi. $1950, offer. Hirose, 967-4790.

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FOR SALE: '71 TOYOTA MARK II Wagon. 56,000 miles, good shape. $800/best offer. Call 262-0777.

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For Sale: 1968 Chevy Caprice, low mileage (58K), 4 door, 8 cyl, AM-FM, auto-transmission, power steering, etc. $900. Bill Mehler, 322-3951.

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FOR SALE: 1972 BMW R75/5 Fully equipped for touring. Extra parts, helmets. Ask for Dan Gragert, evenings, 274-1944.

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'69 Buick Wildcat, PB, PS, AT, AC, good working car $550. Available in Feb. Hirose, 967-4790.

Miscellaneous

For Sale: Ludwig-Zildjian drum set with drum cases. Excellent condition. $750. Jeff Souder, 245-9260.

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New Men's Knapp Aerotied shoes, 12EE – $10. Handmade afgan – $50. New Pro Max 1000 Watt hair dryer, $12. 967-8240.

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For Sale: Irish Setter puppies, AKC, 6 weeks old. 262-4129.

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Nikon R-10 Movie Camera – $570, Nikomat FTN Body – $100. Sony FM-AM Stereo Cassette CF550A – $200. Call Hirose, 967-4790.

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Moving Sale: 1 Queen bed, lamps, end tables, dinette, desk & chair, etc. Many more. Hirose, 967-4790.

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FOR SALE: Smith-Corona portable electric typewriter (ELECTRA) with carrying case; used for typing a thesis only. American thermostat-controlled room heater (1320 watts); like new. 961-0249.

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Enclosed trailer, 14'Lx5½'Wx3¼'H, HD axle, electric brakes, removable top, spare wheel & tire, $250. "Sno-tred" tire chains, large size, new, paid $40, sell for $30. Call Roger Hedlund, 245-9542.

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Need ride to work from vicinity of 1st/Taylor Streets, San Jose, 8–4:30 shift. Call Zelda, x6429 or 293-2527.

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Carpool from Palo Alto area of Middlefield and Oregon to Moffett Field (Ames). Call Olin Campbell, 968-3653 (day) or 326-1634 (evenings).

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Want to Buy: Dryer – Prefer electric, good condition, late model. Call Mary, 733-8339, evenings and Sundays.

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Needed one AR-2 mahogany speaker to match existing speaker on stereo. 964-7289.

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Wanted – Imaginative, fun-loving, hard-working candidates for up-coming vacancies on the ARA Executive Board. All Ames and hard-badge contractor employees are eligible to apply. For more information call ext. 5412.

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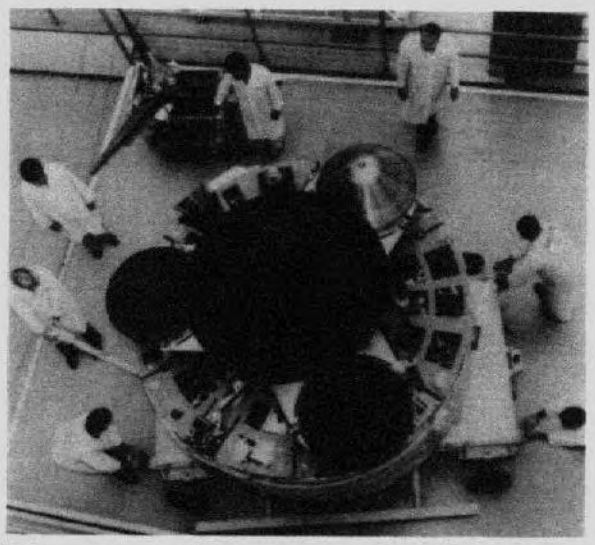
Ames Achievements for 1976

Use has been made of the Illiac to simulate galactic evolution. These calculations, which follow the gravitationally-forced motions of over 100,000 stars in 3 space dimensions, mark the first use of the Illiac for an astrophysical problem.

The first calculation of Venusian atmospheric dynamics that shows wind speeds in good agreement with observation has been completed. This fully 3-dimensional calculation also gives flow patterns consistent with the observed ultraviolet pictures from Mariner 10.

Pioneers 10 and 11 continued to provide scientific data on the interplanetary medium beyond the orbit of Jupiter. Pioneer 10 passed the orbit of Saturn in February 1976 and Pioneer 11 is proceeding toward a Saturn encounter in September 1979.



Pioneer Venus Multiprobe

Checkout of scientific instruments for the Pioneer Venus Multiprobe spacecraft has been completed on the spacecraft simulator and checkout of those for the Orbiter spacecraft is in progress.

A flying qualities and flight controls experiments program has been successfully completed on the Augmentor Wing Research Aircraft. Flying qualities criteria for the approach and landing of STOL aircraft have been defined and satisfactory operation to Category II instrument landing minimums has been demonstrated.

Experiments have been completed in a Cessna 402B on an automatic multisensor navigation concept. The test system consists of VOR, DME, and Air Data sensors controlled by an electronic calculator which processes the data using a 4-state Kalman filter to output ground and wind velocities and position to a map display. Novel features which make such a system potentially low-cost include frequency-scanning operation of a single VOR receiver and a single DME transceiver and use of a shed-vortex true airspeed sensor. Results obtained during flight in a local area where six to eight DME NAVAIDS were receivable yielded better than 1/4 mile accuracy.

Ames Research Center, in cooperation with the National Transportation Safety Board, has developed a technique for deriving time histories of an aircraft's motion from Air Traffic Control radar records for use in accident investigations. During 1976 the accuracy of this technique was established through flight experiments using the CV-990 research aircraft, and applications were made using actual accident records.

A three-year research program sponsored jointly by the NASA and the FAA has resulted in the formulation of tentative civil airworthiness flight criteria for powered-lift transports. The report which presents these criteria has been distributed by FAA Flight Standards Service to the aircraft industry for comment pertinent to the eventual development of airworthiness standards for commercial transport aircraft of this type.

During June and July an institute on Differential and Algebraic Geometry for the Control Engineer was hosted by Ames. It was generally concluded that the theory is sufficiently developed for serious attempts at applications to problems of aircraft control.

Pioneers 6, 7, 8 and 9 continued to conduct synoptic studies of interplanetary phenomena between approximately 0.75 and 1.20 Astronomical Units from the sun. Pioneer 6 has been transmitting valid scientific data for more than 11 years, a record for interplanetary missions.

A flight simulation investigation has been conducted on the Flight Simulator for Advanced Aircraft to determine the hazard presented by large scale wind disturbances encountered during the landing approach. Poor presentation of information to the pilot during critical stages of the approach which delay reaction to the disturbances was found to be the single most important factor contributing to hazardous or catastrophic encounters.

A flight simulation investigation has been conducted of operation of VTOL aircraft from non-aviation ships. Satisfactory capability to perform manual transition from forward to hover flight under instrument conditions and to land aboard ship under adverse weather and sea conditions was demonstrated using a sophisticated model following control system.

Multi-Cyclic Controllable Twist Rotor

The Multi-Cyclic Controllable Twist Rotor is a helicopter rotor which uses high frequency motions of a small servo flap near the blade tip to suppress rotor dynamic loads which lead to undesirable vibration and fatigue damage. This rotor system was mounted on the Rotor Test Apparatus and tested in the 40- by 80-Foot Wind Tunnel. These tests established the feasibility of this technique for reducing rotor vibration.

Two honors bestowed Deputy Director

Ames Deputy Director C. A. Syvertson has been named a Fellow of the American Institute of Aeronautics and Astronautics, the major society for aerospace professionals. In addition, he has also been selected to attend the Harvard Advanced Management Program (AMP) for the thirteen week Spring 1977 session.

Enrolling 160-experienced managers of demonstrated ability, AMP is the largest executive program offering participants an unparalleled opportunity to share experiences with and learn from their peers. The program is an integral part of the Harvard University Graduate School of Business Administration, and is taught by regular members of the faculty whose full-time assignment is this program. Many of the HBS professors are internationally known in their fields, and they combine intellectual strength with practical understanding of management problems. The curriculum includes business policy, financial management, management control, quantitative analysis for decisions, elective courses, etc.

Both selections are a high honor for the long time Ames employee. As for the AIAA award, Syvertson was chosen for his pioneering work in hypersonic aerodynamics (basic to the Space Shuttle), and for his leadership in establishing national policy for the support of civil aviation.

To recap his career much can be said. The pioneering aerodynamicist did theoretical research on hypersonic aerodynamics in the early 1950's, and on hypersonic vehicles (the manned wingless M-2 lifting body) in the late 1950's. These vehicles were precursors to manned maneuverable flight into the atmosphere from Earth orbit.

The Ames researcher headed the Department of Transportation-NASA team which produced the Civil Aeronautics Research and Development Study, a blueprint for current U.S. efforts in aviation development.

"Sy," as the Deputy Director is called, joined Ames in 1948. He was born in Minneapolis, Minnesota, in 1926, and gained B.S. and M.S. degrees from the University of Minnesota. He has been Deputy Director of Ames since 1969, and before that was Director of Astronautics at the Center. He received the AIAA Lawrence Sperry Award in 1957.

Airfoil test apparatus

A new gauge was developed to obtain detailed skin-friction measurements on transonic airfoil models. With the use of this gauge, valuable data were obtained in the new Ames High Reynolds Number Channel to verify turbulence model development.

Computer codes solving the Navier-Stokes equations for complex high Reynolds number inviscid-viscous interaction flows were developed employing advanced multiequation turbulence models. Significant improvement over previous solutions using simpler models was achieved.

The first numerical simulation of the unsteady viscous flow about a transonic airfoil using the time-dependent Navier-Stokes equations was made. Results were in substantial agreement with data obtained in the new Ames High Reynolds Number Channel facility.

The complete flow field of several supersonic adverse pressure gradient flows has been experimentally documented for a wide range of Reynolds numbers in the new Ames High Reynolds Number Channel facility. The measurements which include turbulent kinetic energy and shear stress are being used to verify new multiequation turbulence models.

McDonnell Douglas Astronautics Company under contract to Ames successfully fabricated a half-scale silica reflecting heat shield in support of the Jupiter Entry Probe Program. The reflecting silica heat shield is being considered as an alternative to a carbon phenolic heat shield in the System Design Study for a Jupiter Entry Probe.

A unique new method for measuring the vapor pressure of extremely refractory materials by determination of shock standoff distance during vaporization of the material with laser radiation in reduced pressures has been developed at Ames. This technique has recently been used to measure the vapor pressure of carbon and is currently being used to measure the vapor pressure of uranium oxides.

RCG Coating for Shuttle

In May 1976 Ames developed Reaction Cured Glass (RCG) Coating was adopted as the coating for the Space Shuttle Orbiter High Temperature Reusable Surface Insulation (RSI) heat shield. In July, the first RSI tiles with the new coating were delivered by LMSC to Rockwell International for installation on Orbiter 101. This new coating will significantly increase the lifetime and performance of the Shuttle heat shield.

Theoretically determined molecular constants such as photon absorption cross sections are now being routinely provided for use in predicting the amount of radiative energy absorbed by ablation products in the boundary layer that will form on heat shields during Jupiter entry. These constants for molecules such as silicon monoxide and carbon monoxide are obtained strictly from computer calculations, and are of comparable quality to those which were formerly obtained from shock tube measurements.

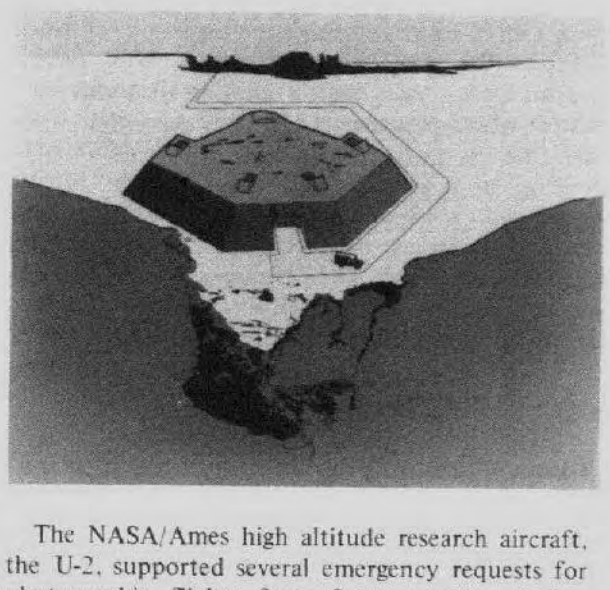
U-2 stratosphere experiments

In the fall, the Ames U-2, now outfitted to carry as many as five stratospheric experiments at once, joined with the Ames CV-990 (Galileo II) to perform a latitude survey mission extending from 80°N over Alaska to 60°S (for the CV-990) from New Zealand and Australia.

Among the many scientific observations made were important new results on the global distribution of fluorocarbons (Freons) in the stratosphere. Combined with current Ames modeling efforts the new data is expected to improve our understanding of potential effects on the earth's ozone layer.

"Project Orion"

The NASA/ASSEE Summer Design Study developed design concepts for telescopes capable of detecting planets revolving around other stars. The project (Project Orion) evolved a design for a novel ground-based astrometric telescope. The new telescope would be nearly 100 times more sensitive than existing instruments and could detect the effect of Jupiter on the Sun's motion when viewed from 150 light-years away.



The NASA/Ames high altitude research aircraft, the U-2, supported several emergency requests for photographic flights from State agencies during 1976. After the Teton Dam break, for example, the aircraft supported requests for photographic documentation. Also, during an uncontrolled forest fire in Northern California, the U-2 provided photographic infrared pictures to assist fire fighters from the State forest service.

In January, 1976, the NASA/Ames U-2 aircraft acquired data for analyzing the volcanic emissions into the stratosphere from Mt. Augustine in Alaskan coastal waters. The Ames designed Aerosol Particulate Sampler (Mr. Guy Ferry), was the primary data system employed for this project. The results indicated that the aerosol structure was not appreciably affected by the volcanic action.

An aircraft program being conducted by NASA/Ames and USDA/ARS demonstrated the feasibility of monitoring crop irrigation needs and yields from aircraft. The technique, based on ground-based data, was developed by USDA. Ames and USDA pioneered its airborne application. The technique utilizes thermal imagery and interactive computer image analysis.

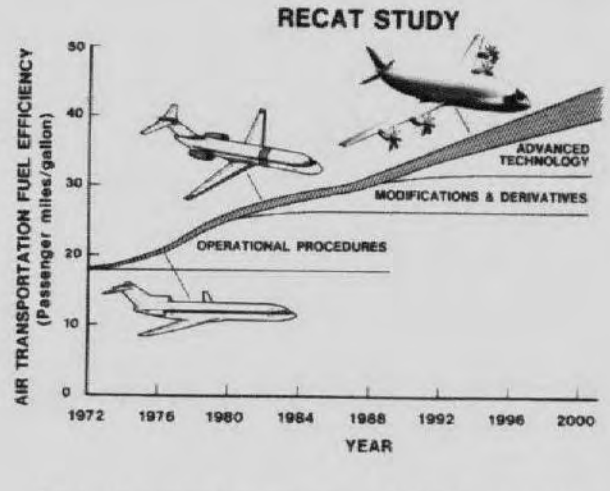
A NASA/Ames U-2 aircraft successfully imaged an occurrence of *red tide* off the coast of Florida utilizing a GSFC prototype of the Coastal Zone Color Scanner (CZCS). This scanner will be flown aboard the Nimbus G satellite in 1978 to monitor worldwide ocean productivity and pollution.

Four detailed military mission studies using a versatile aircraft synthesis program developed at Ames have been completed. These studies included an airborne ICBM launch platform employing a dash-on-warning, a cruise missile, a multi-mission aircraft, and a heavy lift transport.

A series of wind tunnel tests, system studies, and in-house research have been completed on the oblique wing concept and have demonstrated the viability and superior aerodynamic performance of this concept in the transonic and low supersonic Mach number regime.

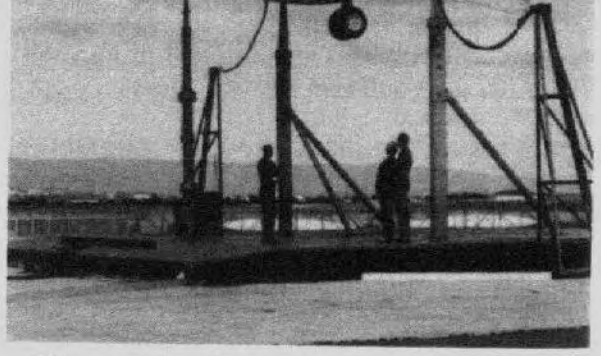
RECAT study

A comprehensive study of the most effective means for reducing the energy consumption of air transportation (RECAT Study) was completed in 1976. This study, begun in 1974, involved the Douglas Aircraft Company, Lockheed-California Company, United Airlines, Inc., and United Technologies Research Center. The attached figure shows the increases in efficiency that appear feasible.



An easy-to-use transonic wing analysis computer code has been developed and validated and coupled with an optimization program. Although still in prototype form, the code is already being widely used at Ames with joint Ames/industry participation to help design wings for high performance military, business and transport aircraft. The code has also been requested by several companies for their own use for these same applications.

The AV-8A Harrier is a British VTOL Aircraft that was purchased by the U.S. Marines. The AV-8B is a major modification to that aircraft and includes a new wing, new inlet, and new exhaust nozzles to improve VTOL and STOL performance. A full scale model of the advanced version was tested in the Ames Static Test Facility and the 40- by 80-Foot Wind Tunnel. This model included the up-rated Rolls-Royce Pegasus II engine with a maximum thrust of 21,500 lbs which will power the AV-8B airplane. A picture of this model installed in the 40- by 80-Foot Wind Tunnel was featured on the cover of NASA News. The tests indicated that the predicted gains in performance would be realized.



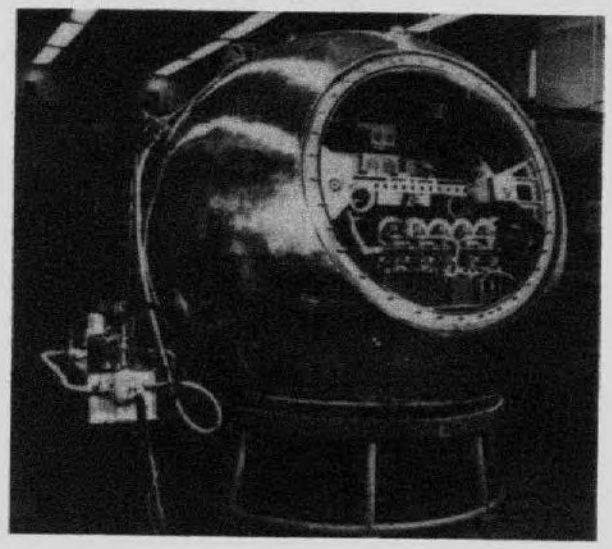
The program, documentation, and user manuals for FLEXSTAB, a program designed for analysis of aeroelastic characteristics of an aircraft, have been completed and transmitted to COSMIC.

A hybrid computer code has been developed using nonlinear potential, boundary layer and Navier Stokes codes in combination to solve two-dimensional transonic flow problems on airfoils with separation. The hybrid code uses the various methods in combination to solve different parts of the flow field. The method shows promise for substantial reduction of computer time while retaining high accuracy.

KOSMOS biological analysis made

The analysis of the first U.S. biological specimens to be flown in a Soviet Satellite, KOSMOS 782, revealed abnormal changes in the rate of bone growth and red blood cell lifetime in rats exposed to weightlessness. Spaceflight did not significantly affect the normal development of minnow embryos, fruit flies, or plant tissues.

Next summer another Soviet biological satellite will be launched. It will contain five U.S. experiments, four of which will extend the results of KOSMOS 782. One new experiment will examine the effects of spaceflight on fat metabolism in rats. The KOSMOS project is managed by Ames and Ames investigators will participate in four of the five U.S. experiments.



On April 15, 1976, the NASA Aviation Safety Reporting System (ASRS) was set into operation. The ASRS provides an opportunity for people (pilots, controllers, and others in the National Aviation System) to report on hazardous aviation incidents which they have experienced or of which they have knowledge. After identities have been removed, the information collected is used to alert the Federal Aviation Administration and others potentially affected, and to gain broader insights into causes of accidents in air travel. On completion of the first six months of operation 2961 reports had been received and 189 ASRS Alert Bulletins released. Broader analysis of collected information for specific enabling factors causing incidents has now begun.

QSRA contract awarded

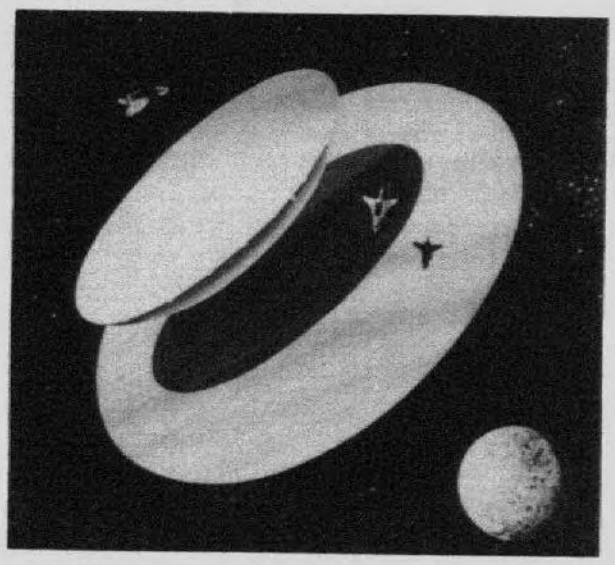
The Quiet Shorthaul Research Aircraft Project (QSRA) was initiated with Contract Award to the Boeing Commercial Airplane Division, Seattle, WA in February 1976. The C-8 Aircraft, which is to be modified, was delivered to Boeing in late June and the 40- by 80-foot wind tunnel model was completed in December 1976.

Viking I and II: Gas Exchange shows unusual chemistry

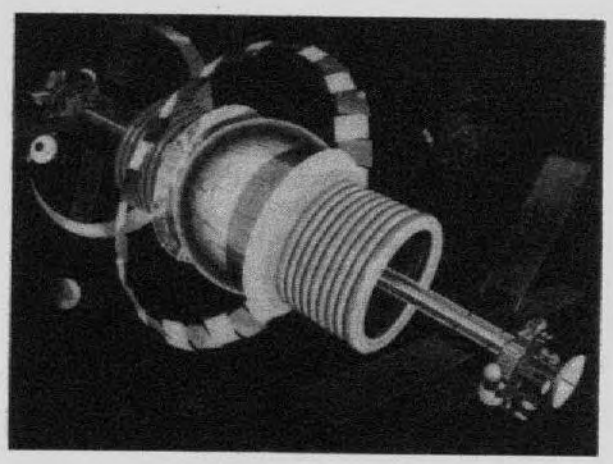
The Gas Exchange Experiment on both Viking I and II demonstrated that unusual chemistry was occurring in the Mars sample. This experiment provided the first evidence that humidified Martian soil generates oxygen. Following this discovery, an attempt was made to simulate the process at Ames. Earth soil, dry and chosen to resemble the soil of Mars as nearly as possible in its composition, was subjected to oxygen glow discharge. When moisture was then added, oxygen was given off. This is thought to be due to the formation of activated oxygen species, like superoxides, in the soil.

SETI completed

The Center Program Team for the Search for Extraterrestrial Intelligence (SETI) has completed a two-year feasibility study of SETI. A moderate, step-by-step approach to the task of listening for signals from extraterrestrial civilizations is envisioned. Space antennas have been shown to be a possible attractive alternative to ground systems (Project Cyclops) for the later stages of a search (see photograph of artist's concept of a 300 meter space antenna). A SETI Program Office has been established in the Life Sciences Directorate to continue studies of SETI systems.



A Center Program Team has been established to conduct studies on the feasibility of constructing space settlements for large numbers of people. The work of the team is based on the concepts for producing space settlements, manufacturing facilities, and solar power stations, as evolved over the past two years in joint studies with Professor Gerard O'Neill of Princeton University. (See photograph of rotating Bernal sphere for several thousand people evolved as a conceptual design for a space settlement during the last Ames Summer Study.) The essence of the O'Neill concept is the use of solar energy and lunar or asteroidal materials for construction, to minimize the amount of material that must be sent from the Earth.



A multichannel cardiovascular telemetry system small enough to implant in 10 kg monkeys has been developed and successfully tested in a Convair 990 airborne simulation of a Spacelab flight experiment. The unit is powered from a source outside the body and telemeters electrocardiogram, temperature, and left ventricular and arterial (aortic) pressures.

Biograf developed

A computerized system called Biograf was developed. It allows the construction and display of important biological molecules, the manipulation of these models on a CRT and the determination of interactions between them. Biograf has been used to explore some problems in molecular genetics and will be used to investigate certain aspects of the origin of life.

A major step was taken in the continuing development of innovative methodology for the structuring of interactions and the establishment of communication among people of widely varied interests and backgrounds that is essential in the emerging art of technology assessment and useful in establishment of policy concerning technology efforts. A workshop was held in Palo Alto, California in August on the subject of the relative roles of the Government, the Aircraft industry, non-profit and independent R&D organizations and the Universities in the R&D process in Aeronautics. High level officials from each of these groups were brought together in a novel and highly structured approach to arriving at a statistically meaningful set of viewpoints in a short, intensive work session.

This effort is a continuation of the pioneering efforts initiated by a National Workshop on Portable Energy, held at Monterey, California in August, 1974 and extended by a National Workshop on Intercity transportation held at Hershey, Pennsylvania in September, 1975.

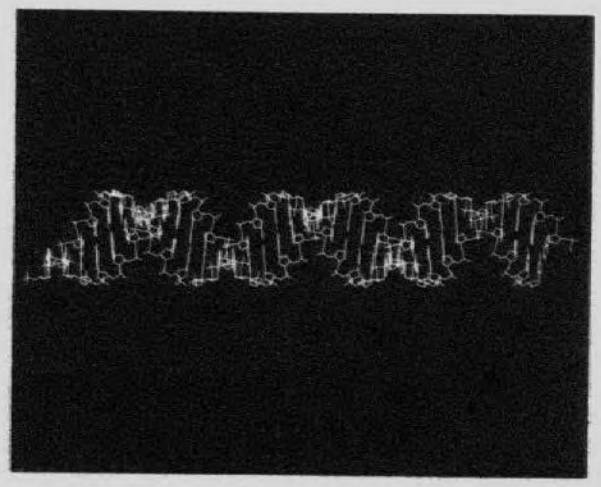
Effective interdisciplinary communication is of growing importance in the decision making process in our modern, high technology society. The results of such decisions have great impact on all sectors of our society and our economy. It is important to be certain that the best solutions to our problems are adopted, based on a thorough understanding of the full consequences of the various alternatives.

The Congressional Office of Technology Assessment and the National Science Foundation have utilized this, Ames Methodology, for application in furthering their broad activities in this field.

Computer graphics

Computer Graphics has been an important research tool for understanding complex computational phenomenon for several years at Ames. Major accomplishments in CY 76 include the ability to visualize and dynamically manipulate three-dimensional figures. Two application areas are using this new facility to study stellar galaxy evolution models and interactions of complex DNA and protein molecules, respectively. The accompanying photographs were taken directly from the 3-D graphics display located in the Central Facility Computer Graphics Laboratory N-233/231. One shows an oblique view of a flattened 2000 star galaxy computed by Dick Miller on the ILLIAC IV. The other shows a segment of a double helix DNA molecule constructed by Yves Coeckelenbergh piece by piece on the graphics equipment in the Central Facility.

The ILLIAC IV achieved its first operational goal by providing users with 60 hours/week of verified time on a continuing basis. The computer played a key computational role in the Fixed-Mobile Experiment (FME) conducted jointly by the Defense Advanced Research Projects Agency and the Department of the Navy.



College curriculum sharing experiment

The College Curriculum Sharing Experiment uses the Communications Technology Satellite to transmit classes simultaneously between Stanford University in California and Carleton University in Ontario, Canada. Students at each university take courses offered by the other using live television with talkback. Ames manages this experiment, and built and operates the west coast ground station. The satellite transmission uses compressed, digitized television, developed by Ames, which requires lower power and less bandwidth than conventional FM techniques. The experiment provides needed information for the design of future educational telecommunication systems.

The first complete documentation of a two-dimensional separated shock boundary-layer interaction has been accomplished by experiments using a laser velocimeter. Complete two-component mean velocity profiles including reverse velocities, as well as turbulent fluctuating velocities were obtained through the regions of flow interaction. These results show that the normal component of shear stress may not be negligible which is contrary to earlier work on unseparated shock boundary-layer interaction.

Reliable RMS density fluctuations have been measured for the first time in a turbulent shear layer at transonic speeds using a laser doppler velocimeter in combination with a hot wire anemometer. The density fluctuations are shown to be much smaller than velocity fluctuations. These measurements are essential for the understanding of the propagation of electromagnetic waves through turbulent media as well as for the understanding of the turbulent boundary layer itself.

A working breadboard was constructed and evaluated, and a contract for flight instrumentation was awarded to TRW, where construction is nearly complete.

Tom Fryer was Chairman of an international NASA-Stanford sponsored Biotelemetry Conference held successfully at Asilomar last spring. Proceedings of the conference were edited and published.

New biotelemetry systems were developed and used to measure intracranial pressure and body temperature. The latter system is inductively powered from the wall of an animal cage.

A detailed contractual study on the civil uses of remotely piloted vehicles has been completed and has identified a number of potential applications.

Valid aerodynamic flight data on an oblique wing aircraft were obtained at yaw angles of up to 45° through the use of a remotely piloted research aircraft.

A new method for screening materials for their toxicity in fire situations has been developed jointly by the University of San Francisco and NASA-Ames Research Center. This method is useful for comparing materials for relative toxicity under specific test conditions; the comparative data are used in conjunction with other fire response characteristics such as oxygen index, fire containment, fire spread, heat release, and smoke, to help select materials with the most promising overall properties.

The method utilizes a small hemispherical animal exposure chamber of a design previously developed and patented by NASA, to expose Swiss albino mice to the gaseous products of pyrolysis and combustion, with observations made of responses including incapacitation and death under different specific test conditions.

The RF Division has completed for the Aeronautics Division, the design of a Two-Dimensional Oscillating Airfoil Test Apparatus. This apparatus will be used to obtain experimental unsteady aerodynamic data on aileron flutter and helicopter blade sections. The Test Apparatus is now being fabricated and is scheduled for tunnel tests in late 1977.

Design and fabrication have also been completed on the Rotary Balance Apparatus, scheduled for use in the 12-Ft Pressure Wind Tunnel in mid-1977. This mechanism provides rotary motions for obtaining experimental data for computing the stall/spin characteristics of a given aircraft design.

Laser Doppler Velocimeter (LDV): Instrumentation permitting the measurement of two components of velocity of a single dust particle in turbulent flow has been designed and put into operation in the ARC High Reynolds Number Test Facility. A similar system to be installed in the 6 X 6 wind tunnel will include the first use of an elliptical mirror as a light collector.

Miniature Echosonomers: Transcutaneous and implantable devices for measuring internal body structures using ultrasonic techniques have been completed. One which gives a cross-sectional transcutaneous display has been accepted as a shuttle experiment.

Angle Indicating Digital Servo: The semi-mechanical analog servo used with the dangleometer for many years at ARC has been replaced with an all solid state digital servo to reduce maintenance problems. Wind-tunnel tests have been successful.

Airfoil Pressure Display: An analog computer/display system has been built to give a dynamic continuous graph linking 10 pressure readings from moving airfoil.

Ames Research Center has developed a plasma polymerized coating for polycarbonate space-suit helmet visors, which improves the abrasion resistance and light transmission characteristics of the visor.

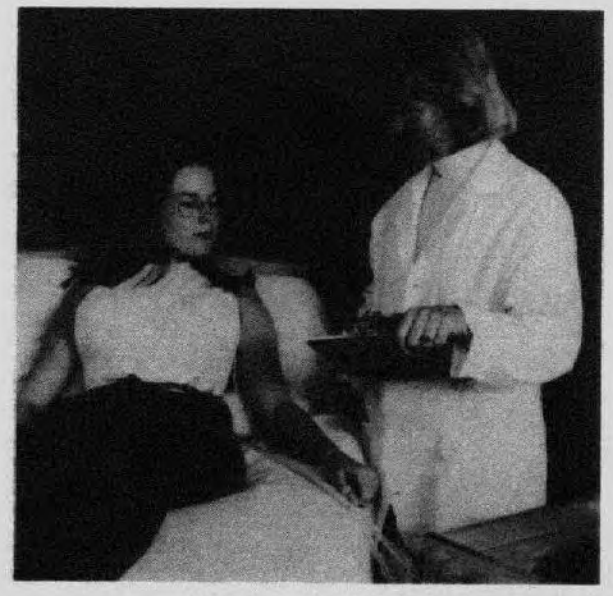
Tech Utilization Office

The Technology Utilization Office efforts in the transfer of Ames technology resulted in the licensing of the industrial model of the Liquid-Cooled Head Liner. The product is now manufactured and distributed by Acurex. Patent applications for three additional items, the "Liquid-Cooled Bra for Breast Cancer Detection," an "Electrophoresis Apparatus for Forensic Medicine" and the "Seismic Security System," have been completed and are ready for transfer.

Technological contributions to medicine and the delivery of health care services include the development of a portable ultrasonoscope, vision test system for mass vision screening, eye tracker and a pediatric monitoring and transport system. An interagency program with the State Department of Rehabilitation to assist in planning and providing technology for the "Delivery of Rehabilitation Engineering Services" in the State of California was implemented.

48 Ames innovations were published in the NASA Tech Brief Journal. Briefs are now published in an attractive quarterly magazine; circulation 20,000 per issue. 75 awards were presented to Ames Staff members in recognition of their innovative new technology.

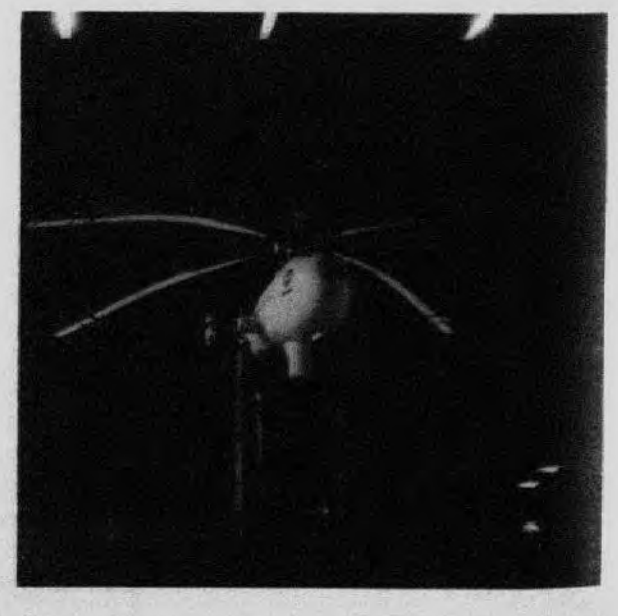
1,892 requests were received for Technical Support Packages for Ames published innovations during 1976. 10,109 general inquiries were received for Technology Utilization publications, specific technical information or special data packages in various fields of technology. 57 speeches and presentations were made to professional societies, Federal, State and Local Government organizations, educational institutions and the general public.



US AMRDL accomplishments

In-flight acoustic measurements were made at AEFA of the Army's UTTAS and AAH competitive helicopters. A photograph is available of YO-3A fixed-wing quiet aircraft flying in formation with one of these helicopters (AC76-1394-257). The in-flight rotary-wing acoustic signature measurement technique was conceived and developed by the Ames Directorate with support from NASA. The information available by use of this technique represents a major advancement in rotor acoustics diagnostics by providing accurate, stationary measurements of the highly directional noise generated by a helicopter rotor. The technique was used by the Army Source Selection Evaluation Boards to evaluate the acoustic characteristics of both competitive helicopters in the UTTAS and AAH programs with the YO-3A aircraft as the instrumentation and mike support.

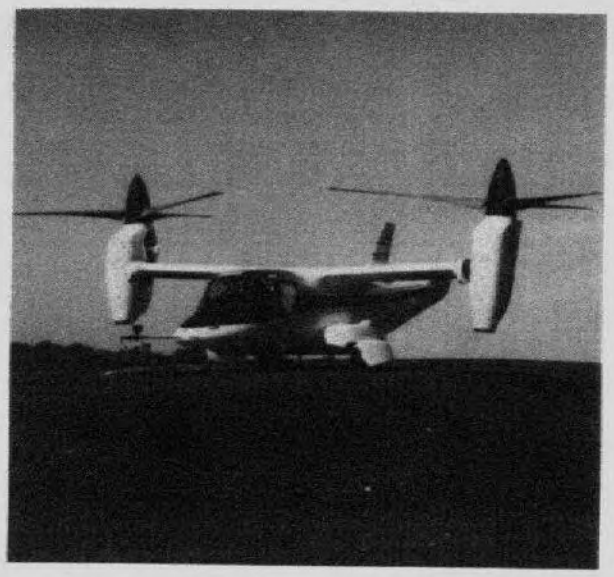
Wind tunnel tests were conducted in the 40 X 80 ft wind tunnel of Multicycle Controllable Twist Rotor (MCTR) mounted on that tunnel's new Rotor Test Apparatus. A photo is available of the MCTR in the 40 X 80 ft wind tunnel (AC 75-1633-1). The Kaman MCTR has successfully completed a comprehensive wind tunnel test program in the NASA-Ames 40 X 80 ft wind tunnel. The MCTR has a conventional swashplate control system which varies the blade root angle sinusoidally during each rotor revolution. In addition, the MCTR has a flap near the blade tip which can be controlled independently to cause the blade to twist from root to tip. During multicyclic operation, the servo-flap angle is varied with frequencies up to four cycles per revolution. By proper control of variables, vibratory loads can be decreased and performance improved.



Tilt rotor rollout

Rollout ceremonies of the XV-15 took place at contractor's activities on 22 October 1976.

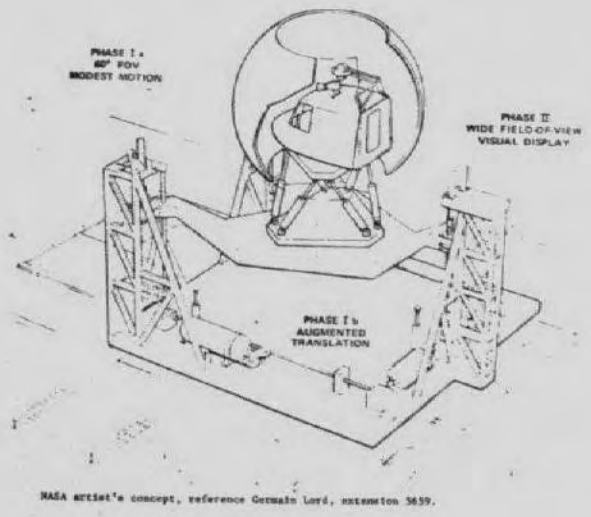
The XV-15 tilt-rotor plane was built by the Bell Helicopter Textron company and is the first of two such aircraft being produced under a NASA/Army contract. The craft combines features of both helicopters and conventional airplanes.



The XV-15 design is a 42-foot-long, 32-foot wingspan aircraft incorporating wingtip mounted engines, transmissions and 25-foot prop rotors which tilt from a helicopter position for hover, vertical takeoffs and landings, to a horizontal position for forward flight. In the airplane mode, the aircraft is capable of forward speeds of more than 300 miles per hour. It is expected that the tilt rotor will operate with less noise than conventional helicopters or turboprop aircraft of comparable size. (From NASA Activities – Vol. 7, No. 12, Dec. 76.)

A new start program for 1976 was a joint NASA/Army Rotary-Wing Research and Development Simulator. The simulator will provide a much-needed capability for conducting rotary-wing research and development programs and fill the gap between the wind tunnel and the experimental flight article in the development cycle. Scheduled stand-alone completion date is 1983 as a total cost exceeding 17 million dollars.

SIMULATOR CONCEPT



NASA artist's concept, reference Gertrude Lord, extension 5659.

Thank you

We want to extend our heartfelt gratitude to all of Bonnie Malmos' friends at Ames for all of the love and concern shown during her illness. A special "Thank You" to the wonderful people who donated blood on her behalf. We pray that your donations, in her name, to the Oral Roberts University Medical Building Fund will help in finding a cure for cancer. God bless each and every one of you.

The Hays Family

Honors and Awards

National Civil Service League's Special Achievement Award for 1976 – Charlie Hall. Given in recognition of excellence in public service.

Federal Executive Board's Service to Community Award – John Kirkpatrick, Federal Employees Distinguished Community Service Award. Zelda Ballantine, Federal Employees Community Service Award. Thomas Walsh, Federal Employees Community Service Award.

R. T. Jones – NASA Special Achievement Award for his many contributions to aeronautics.

NASA Group Achievement Award – Reaction Glass Coating Development Team.

NASA Exceptional Service Medal – Howard K. Larson.

NASA Medal for Exceptional Service – Lewis Hughes.

NASA Exceptional Scientific Achievement Award – Howard E. Goldstein.

NASA Exceptional Scientific Achievement Medal Award – James B. Pollack.

NASA Exceptional Service Medal – Richard C. Simmonds (Major).

NASA Exceptional Scientific Achievement Medal – Sherwood Chang.

NASA Group Achievement Award – Richard L. Kurkowski and Mark H. Waters.

NASA Group Achievement Award – Kuiper Airborne Observatory Team.

General Deane visits Ames

General John R. Deane, Jr., Commander, U.S. Army Materiel Development and Readiness Command, was briefed on AMRDL-NASA projects during a visit here Friday, 7 January.

L to R: General Deane; Dr. Richard M. Carlson, Director of the Army Air Mobility R&D Laboratory, AMRDL; Colonel John B. Fitch, Deputy Director, AMRDL; and Lt. Col. John Henderson, AMRDL R&D Coordinator.

Dr. Hans Mark, Director of the Center, and Dr. Leonard Roberts, Director of Aeronautics and Flight Systems were also present during the briefing.

Announcement

Under existing law (Sec. 7, Public Law 91-303 (84 Stat. 372)), NASA employees formerly employed by certain aerospace contractors are required to submit a report, containing information specified in the statute. Personnel who were formerly employed by any of the listed aerospace companies are required to file such a report by February 15, 1977, if they also meet the following criteria (for list, see Ames bulletin boards or call Records and Reports, X5610):

1. Employment with the listed aerospace contractor terminated on or after July 1, 1972; and

2. Salary rate during employment with the listed aerospace contractor was $15,000 per annum or more; and

3. NASA salary rate at any time during the period July 1, 1975 through September 30, 1976 was equal to or greater than GS-13.

More detailed information on filing may be found in NMI 3309.1A dated December 8, 1976. Additional information and NASA Forms 1480 may be obtained from and should be returned to the Records and Reports Branch, Mail Stop 241-5.

Failure to file report is punishable by a maximum of six months imprisonment or a fine of not more than $1,000, or both.

Safety belt usage

The following article is submitted for your information. A copy of the ruling may be obtained from the Safety Belt Usage Branch, National Highway Traffic Safety Administration, U.S. Department of Transportation.

Disuse of Belt Curbs Claim in Injury Suit

An appeals court has ruled that a person injured in an automobile crash may be limited in recovering damages if he failed to wear a safety belt.

The New York Times reported that the New York State Court of Appeals in Albany upheld the action of a jury which disallowed a damage claim by a woman who was ejected from her car equipped with seat belts which she was not using.

The plaintiff, Alyce Spier of Madison County, N.Y., was flung from her car after a tractor-trailer attempted to pass and struck her vehicle. The court, in reviewing Spier vs. Barker, last week held in effect that the failure of the plaintiff to strap herself in "resulted in increasing the extent of . . . injuries and damages."

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-34	Equipment Maintenance Mechanic Leader	WL-11	RFTS	Centerwide	2-04-77
77-35	Travel Clerk	GS-4/5	AFP	Centerwide	2-04-77

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-22	Supervisory Contract Specialist	ASA	Alfred Schrupp
77-23	Supervisory Contract Specialist	ASF	Dennis Brown
77-24	Supervisory Contract Specialist	ASL	Francis Frasca
77-25	Supervisory Contract Specialist	ASR	Robert LaMere
77-30	Lead Travel Clerk	AFP	Arlene Robinson
77-32	Contract Specialist	ASR	Cancelled
77-29	Computer Equipment Analyst	FLI	James Cox

Ames Black History Program February 7-11

"Where are the Scientists and Engineers of Tomorrow?" is the theme of Ames' 1977 Black History Program planned for the week of February 7-11. Our keynote speaker will be Nettye Goddard, Supervisor for Human Relations and Staff Development at the San Jose Unified School District. In keeping with the theme of the program, Ms. Goddard will discuss educational activities for motivating student achievement in the sciences, and what role NASA can play in working with public schools to enhance science education.

Ms. Goddard began her career 35 years ago as an English teacher in Alabama. She came to San Jose in 1957, and has since taught English and other subjects in high schools and colleges around the Bay Area. From 1969 to 1972 she was Coordinator of the Black Studies Program of the San Jose Unified School District. In this capacity she developed Black Studies curricula for the secondary schools of the San Jose district, which have since been used throughout California and in other parts of the country.

As a consultant, Ms. Goddard has conducted workshops on Black Culture, The Black Experience, and Multi-Cultural Curriculum Development, among other subjects. In 1975, Ms. Goddard was listed in *Who's Who in Education*. In 1976 she was nominated by the San Jose Mercury for the Woman of Distinction Award, and was named Fellow of the Institute for Development of Educational Activities under the Academy of Fellows Program.

Other activities planned for the Black History Program include an exhibit of work by Black American artists to be displayed in the main library, and Ames tours for junior high and high school students from predominantly minority schools in the area.

Want ads

Transportation

For Sale: 1973 JEEP CJ5 304 V8; 4:27 trac-lok; 3 speed; extras, $3400. 736-7648.

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PORSCHE – 1971. 911T; 5 speed; excellent condition. 65K mi.; AM-FM tape; new brakes; tires and lacquer paint (mint). $7,995 or offer. Call 867-5728 after 5:30 p.m.

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'75 Vega Wagon, 4 speed, AM/FM/Tape. $2900/offer, 238-1579 after six.

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76 Honda 750 cc. 700 miles; exc. cond., 238-1579 after 6 p.m.

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'73 ALFA ROMEO GTV. Recently overhauled. Excellent condition, AM/FM/St. cassette. $4200 or make offer. 258-9853 after 5 p.m.

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For Sale – 76 Ford Ranger, mag wheels, power brakes, power steering, 6 cylinder, 3 speed, 15,000 miles – $5,000. Call 984-5899 after 5 p.m.

Housing

FOR RENT: Beach house at Pajaro Dunes, completely furnished, cleaning included in the rent, beautiful views of Monterey Bay. See picture on bulletin board in cafeteria. Reserve now for winter and spring weekends. Call John Lundell, 257-7260.

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SQUAW VALLEY RENTAL: Skiing with no traffic headaches. Fully furnished Condo. Sleeps 5. Three-minute walk to lifts. Call Ray Savin, 964-2170.

FOR RENT: Think snow! Beautifully appointed mountain home five miles from Dodge Ridge. Sleeps 10, everything furnished except linens. All-electric kitchen, drapes and carpets. Beautiful setting. Reserve early. Families preferred. Contact Mrs. Kelley, phone 294-9289.

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FOR RENT: Palo Alto. Spacious 2 bdrm condominium, end unit, private entrance. AEK, dishwasher, disposal, washer/dryer. Water/garbage paid. No pets. Available March 1st. Call 321-6409 after 5 p.m.

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FOR RENT: Top neighborhood, 3 bdrm, 2bth, carpets, drapes, 2-car garage, fireplace, fenced backyard, fruit trees. 8 miles, easy drive to Moffett Field. 252-3937 evenings.

Miscellaneous

FOR SALE: New Sony Walkie-Talkies (transceivers), 100 MW, Channel 11, effective range 6-11 miles over flat terrain. Carrying cases. $90 for two ($150 value), 294-9289.

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FOR SALE: Lovely genuine pearl ring size 6, never worn, $45. Solid silver bracelet, $50 (both for $75), 294-9289.

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FOR SALE: Painted drop front desk, $20; men's Knapf aerotred shoes 12EE, new and never worn, $10; knit shawl, $12; crocheted afghan, $50; burl coffee table, $100. 967-8240.

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Quarterhorse mare, AQHA perm. reg., chestnut, ribbons, trail and pleasure, $1600. Horse hood, fleece lined, like new, $35. 657-1226.

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German violin for sale. Telephone 923-7421 evenings.

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FOR SALE: Platform bed, firm mattress (foam) $70, 326-7492.

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FOR SALE: Wood bookcases, 3x6 ft, adjustable shelves, $60 each, plus several smaller ones. 326-7492.

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FOR SALE: Bureau chests, 6 drawers and 3 drawers, 326-7492.

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School desk, large storage and working areas, adjustable swivel seat, very durable, ages 6–14 approx., excellent condition, $10. 257-0583.

– – – – –

FOR SALE: Queen size "Hide-a-bed", brn/white Herculon, perfect condition, $150. Girl's Schwinn 3-spd 26" bike, needs 1 new tire, $20. Girl's 20" bike, good condition, $30. Brown dinette table, perfect, $50. Universal fire screen, $4. Misc. drapes in perfect condition, make offer. M. Wash, 259-7607, after 5:00 p.m.

– – – – –

All wood student desk (size: 42x16) with 7 drawers. Very good condition. $35. Call 321-1858.

– – – – –

Brown sofa with a matching chair, very good condition, ideal for an apartment, $125. Will sell separately. Call 321-1858.

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Twin size blankets, like new, $10 each; bed covers, $5 each; bed sheets, $3 each; all in very good condition. Call 321-1858.

– – – – –

For Sale: Twin beds (new), $70 each. Both with king-size foam pad and bedspread, $130. Call Carlton McMahon, 253-5445.

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Interested in sharing ride or driving with me from Hayward/Fremont area? Call Falade at ext. 6266, 8 a.m. to 4:30 p.m.

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The Astrogram

VOLUME XIX NUMBER 9

February 10, 1977

In Memoriam
H. Julian Allen, 1910-1977

H. Julian Allen, the man whose work made possible the safe return of the Apollo astronauts to earth, died of a heart attack at the Stanford University Hospital on Saturday, January 29. He was 66 years old. With his passing, the United States has lost one of the major figures in modern aerospace technology.

Mr. Allen's most outstanding engineering achievement was being the originator of the concept of bluntness as an aerodynamic technique for greatly reducing the severe heating problem spacecraft reentering the Earth's atmosphere. His concept revolutionized the basic design of ballistic missiles. Based on this concept, he was the first to propose that a blunt, manned reentry capsule be employed for safely returning astronauts from space. This fundamental design was used successfully on the Mercury, Gemini, and the renowned Apollo project.

One of Mr. Allen's earliest scientific contributions of significance to the aviation industry was the development of a general theory of subsonic airfoils. The so-called low-drag airfoils, used on aircraft such as the Mustang Fighter in World War II, were improved considerably through this general theory. Beginning in the mid-1940's, his technical leadership was a driving force behind the development of the various high speed wind tunnels at the NASA-Ames Research Center, which now represent one of the country's primary resources used in the development of advanced aircraft for the aviation industry and military defense of the Nation. These national facilities, in a sense, are a monument to his career.

In addition to being a distinguished scientist and engineer himself, Mr. Allen was also an inspiring leader. A whole generation of aeronautical engineers was guided and inspired by him at the Ames Research Center. He served in a number of leadership positions at Ames, capping his career by a term as Center Director from 1965 to 1969.

Within the aeronautical and space community, Harvey Allen probably will be remembered best among his many associates for his marvelously warm sense of humor, which blended with his highly creative mind to delight and stimulate all of those who worked with him. His many friends and colleagues respected him for his outstanding engineering accomplishments and came to love him as an uncommonly genial and delightful human being.

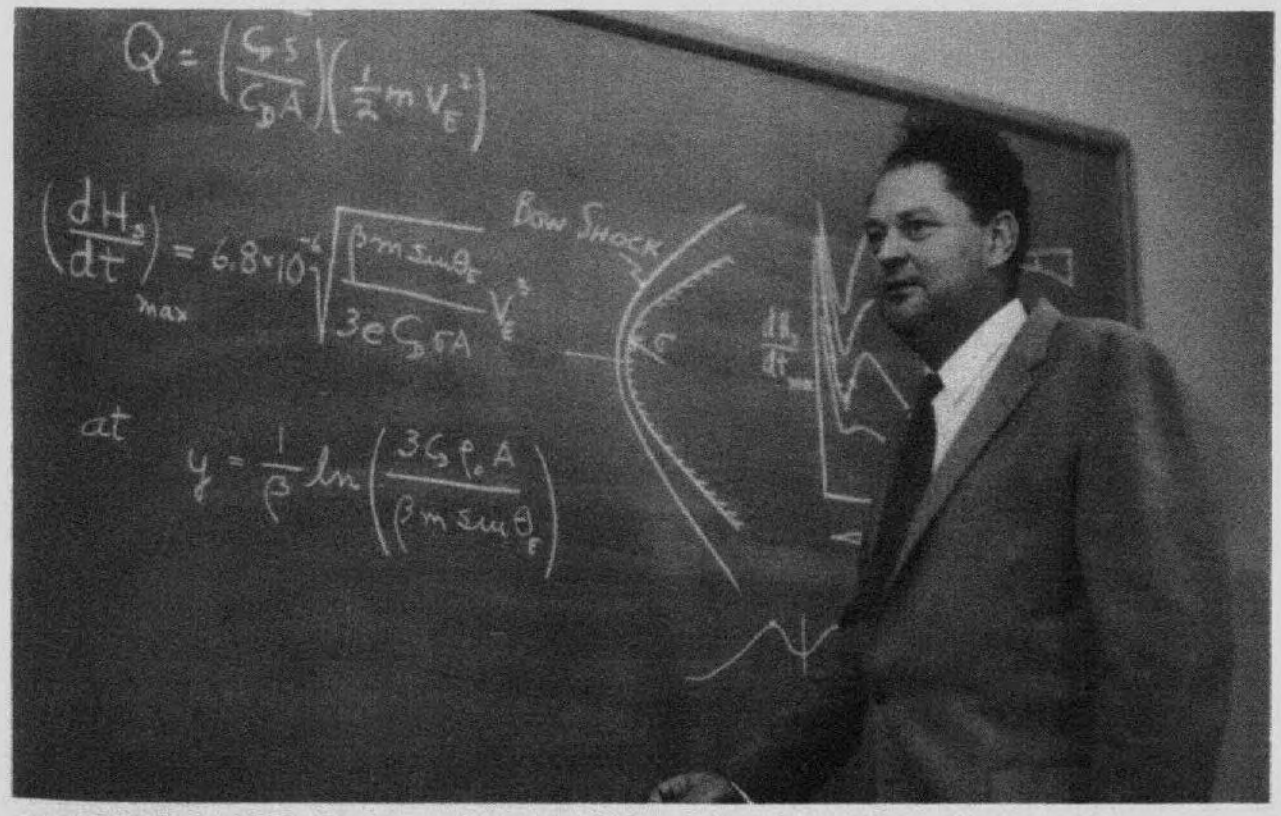
To capture some of the thoughts, feelings and reflections of many Ames researchers and administrators toward Harvey Allen, the Astrogram asked for comments from some of his close friends and associates here at Ames.

Jack Boyd assisted H. Julian Allen for a number of years and he writes: "Harv was a friend, a teacher and never ending source of inspiration. He loved beauty, logic and common sense. He disliked sham, pretense and pretentiousness. We admired him for his infectious sense of humor, his intellectual insight and his willingness to share his many interests and talents with others. We will miss his presence but will long be influenced by his having been with us. Harv was unique and he is gone. I believe he would want us to remember the good and stimulating times and not tarry over his departure."

Bill Harper reflects back on the years of research he spent with Harvey Allen and states: "The list of specific technical contributions made by Harvey himself is long. But the list of technical contributions made through his influence on other Ames research people is at most endless. This influence on Ames and its people was obvious when I first came to Ames in 1941. And it appeared in unusual ways.

"Harvey Allen and Harry Goett came to Ames from Langley at about the same time and for many years, between the two of them, they directed nearly all of Ames' research. The competition between the two of them to have his ideas pursued was tense but friendly. The educational impact on a young engineer, caught between these two, each arguing his own case in a most convincing way, was enormous. To strengthen his case, Harvey was always holding parties at his home which quickly turned into intense technical arguments, to the dismay of the wives, and led to monumental hangovers. But the scientific challenges exposed in all these arguments laid the foundation for Ames' concentration on and success in the world of more basic research. And Harvey was not satisfied with simply turning attention to a problem. No matter who you worked for, you could expect to find Harvey dropping by to learn of your progress and constructively criticize what you were doing. Usually he announced his presence by whistling a phrase from a piece of classical music and demanding the title of the piece and the name of its composer.

"Harvey's influence will be felt for a long time. His students have gone far, in and out of NASA, and it is easy to see in their actions that their formative years occurred under the influence of Harvey Allen."



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Dean Chapman comments, "Harvey's technical work commanded the respect of everyone and his warm sense of humor delighted those with whom he worked. Harvey Allen was respected for what he did, and liked for what he was. He could make almost any subject amusing or interesting and, in fact, could address nearly any subject presented to him. Harvey was a sincere, informal and casual person who made people feel easy and comfortable when with him. Often, toward the end of a working day, Harvey would finish up his work and tour his division or portions of the laboratory during the years of his directorship. He kept close tabs on the people and their projects and made stimulating comments and suggestions to the researchers. These were received enthusiastically. Harvey had a fun and friendly nickname for many of the people at the laboratory and he always had a friendly and informal greeting which put most people at ease.

"I would say that the singular, most outstanding thing about Harvey Allen was his wonderful sense of humor. He made people laugh with him – seldom at anyone or anything. Harvey used his sense of humor very effectively in conversing with people. Another outstanding dimension to this man was his highly creative mind which functioned in an imaginative and practical way throughout his career.

"Harvey had a wide range of interests. His extensive collection of books in his home demonstrated this fact. One could find an oriental cookbook next to literature on aeronautics, which could in turn be situated next to works describing ancient oriental art and furniture, or archeological diggings. His record collection was phenomenal and his interest in antique automobiles amazing. Harvey was indeed a unique, warm, sensitive, and sincere human being."

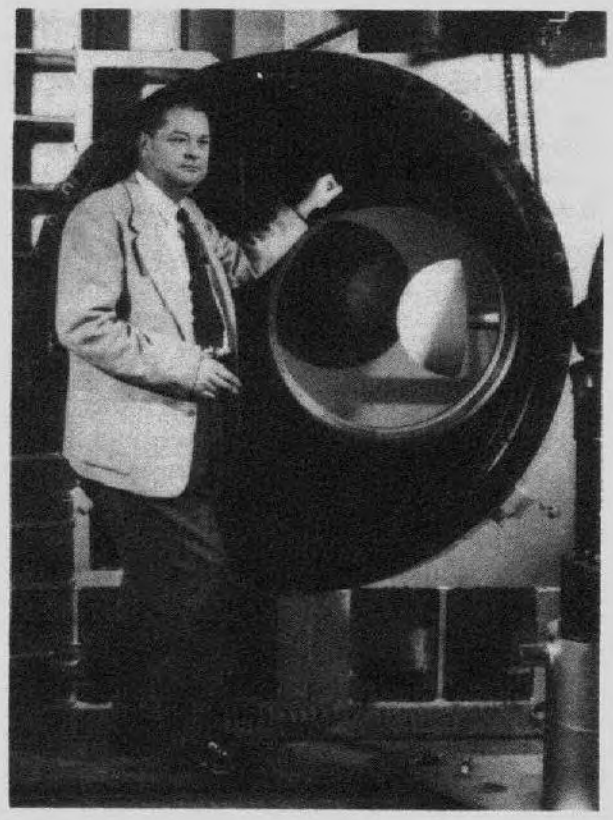
"When he came out to Ames and I remained at Langley Field, I remember a letter he once wrote to us at the Lab. He said he was chief of the Theoretical Aerodynamics Group *and* the Reinforced Concrete Section! And, as Harvey put it, 'Carl Bioletti heads up the Construction Division, because HE has the book!' He was a character.

"Harvey had a lifelong fascination with airships, though he knew they were impractical. In fact, he could have been considered an expert on the subject of airships. At noontime he told many stories of the various near accidents of airships. The most famous was when he was at Mines Field in Los Angeles and witnessed the takeoff of the Graf Zeppelin as piloted by Hugo Eckhart. Evidently the ship was having difficulty lifting off – so much so that the crew was madly throwing excess weight, including lettuce and other foods, off the airship. Harvey would tell this story and relate its absurdity quite vividly. We had some fun and unusual lunchtime conversations with Harvey.

"And of course on the technical side, he and Al Eggers wrote *the book* on the re-entry of the blunt nose vehicle into the Earth's atmosphere. This revolutionized everybody's thinking and certainly made Eggers and Allen famous for their excellent work."

Al Seiff worked for Harvey Allen for many years and he speaks highly of the past Center Director in stating, "When I first came to Ames in 1948, I went to work for Harvey Allen in the Supersonic Free Flight Wind Tunnel. I found Harvey to be an extremely friendly and receptive person who always had a gleem in his eye. He was probably the most informal leader of people and, at the same time, one of the most effective.

"He had a simple technique for managing research. He would identify people of talent; suggest challenging problems; and then stand back and let nature take its course. He was a hands off, as opposed to over the shoulder, manager. This technique really worked, in my estimation, particularly since Harvey was such an excellent judge of abilities.

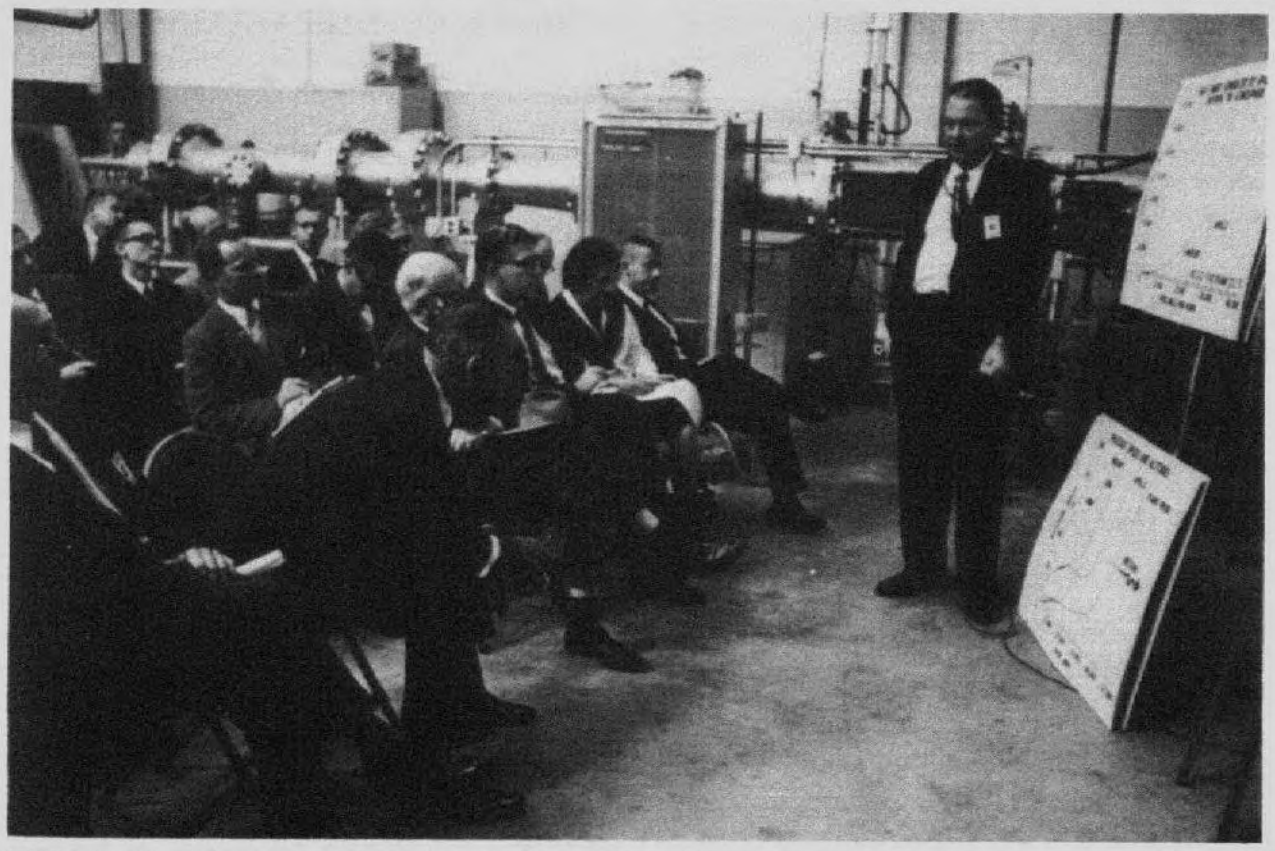


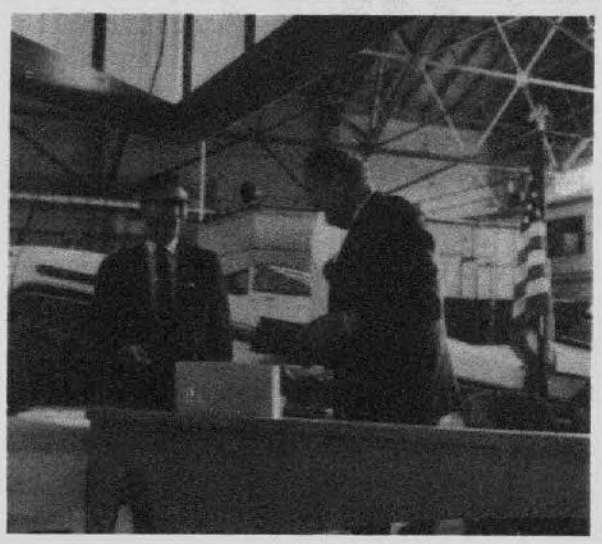
Dr. R. T. Jones knew Harvey Allen when both men worked at Langley back in the mid thirties. R.T. recollects, "Harvey Allen was human, natural and outgoing. He was sensible and surely not opposed to having fun. I remember back in Hampton when there was a housing shortage and a group of engineers, including Harvey, got together and rented a large house and formed what we came to know as "Club 56." The group also formed an orchestra and Harvey played the piano. He also loved to compose music. It was a fun-loving bunch.

"Harvey himself had a great ability for creative research. I have no doubt that he was a genius. His death is a double tragedy both in the loss of the man as a human being, and of his mind, sharpened and developed over 50 years.

"In addition, I would call Harvey Allen a lovable man. And I don't use that phrase lightly. He possessed a great deal of warmth and humanity. He was a great storyteller and had the ability to take a simple story and make it sound fascinating. Our many lunchtime conversations focused on numerous subjects – few of which were work related. Some, however, were spent with Harv telling of his experiences as a young engineer at Langley Lab. He would captivate his audience and often times have ten or twelve people at the lunch table listening to his tales. He had a terrific capability for entertaining people. He carried this characteristic over into his public speaking and could often bring his audience down in laughter.

"Harvey Allen's first love was 'excellence in research.' He recognized and encouraged it in others. He enjoyed the intellectual, what some have called 'the life of the mind.' Harvey provided an environment in which research flourished and, as a result, there are a lot of people at Ames who owe this man a great deal, for they were allowed and encouraged to do creative research in a stimulating atmosphere."





Harvey Allen was educated at Stanford University, where he earned his Bachelor's and Engineer's degrees. Upon graduation from Stanford in 1936, he joined the Langley Memorial Laboratory of the National Advisory Committee for Aeronautics at Hampton, Virginia. In 1941 Mr. Allen returned to California when our Ames Research Laboratory was established. He spent the rest of his brilliant career at this institution.

Mr. Allen's contributions were widely recognized nationally and internationally. He was the author of numerous technical papers and received many honors and awards. Among the most important were NASA's Distinguished Service Medal and the Medal for Exceptional Scientific Achievement, which were awarded in 1957 and 1965 respectively. He received the Sylvanus Albert Reed Award of the Institute of Aerospace Sciences for his distinguished contributions in 1955, and in 1958 was selected to give the Wright Brothers Lecture by the same organization. Also in 1958, Mr. Allen received the Air Force Association's prestigious Airpower Trophy in recognition of his technical contributions to the National Defense. Mr. Allen was an Honorary Fellow of the American Institute for Aeronautics and Astronautics, a Fellow of the American Astronautical Society, a Fellow of the Meteoritical Society, and a Fellow of the Royal Aeronautical Society, London. He was a member of the National Academy of Engineering.

Mr. Allen was born in Maywood, Illinois, in 1910 and was a resident of Palo Alto for many years. He is survived by his sister, Mrs. Josephine Wallace McMurtry, San Antonio, Texas; another sister, Mrs. Dorothy Aldrich, Walnut Creek, California; and his sister-in-law, Mrs. Ruth E. Allen, Menlo Park, California.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-36	Administrative Specialist (STEP)	GS-5/7	FOR	Centerwide	2-18-77
77-37	Personnel Clerk (Typing or Clerk-typist)	GS-4/5 or GS-3/4	APX	Centerwide & Outside	2-18-77
77-38	AST Technical Resources Management	GS-9/11/12	SEM	Centerwide	2-18-77
77-39	Research Aircraft Inspector	WG-14/15	FOI	Centerwide	2-18-77

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-9	Purchasing Agent	ASP	Emily Foley (Outside Candidate)
77-11	Personnel Clerk (Typing)	APM	Gloria Hoeninghaus
77-19	Security Clerk (Typing)	APS	Patricia Torrello (Outside Candidate)
77-28	Accounting Technician (GO)	AFB	Olive Cooper
77-27	Secretary	RFP	Cancelled

ARA ACTIVITIES

New trophy at Ames

The revolving trophy for the winner of the second NASA Inter-Center Jogging Competition won by Ames is now on display in the trophy case at the back of the Cafeteria. Congratulations to all who represented Ames in the competition!

In order to ensure that the trophy stays at Ames as the winner in the next Jogging Competition next May, the Joggernauts are sponsoring 2-mile handicap races every other Tuesday, starting February 15. Runners will meet in front of Bldg. 245 at 11:30 a.m. and be assigned a handicap. Anyone interested in taking part should contact Bruce Castle, Ext. 5089.

Happy hours

The first Happy Hour of 1977 was January 28th, sponsored by the Ames Ski Club. Future Happy Hours are scheduled for

Date	Sponsor
February 18	Jetsetters
April 1	Softball Team
May 27	Photo Club

ARA election

Five vacancies are coming up soon on the ARA Executive Board. If you are interested in running for election to the Board, contact Denise Lucy, Ext. 6645.

Fastpitch softball

The NASA Ames Fastpitch Softball Team will start practicing for the 1977 softball season. Interested players contact Bruce Ganzler, x5943.

Want ads

Transportation

1976 Triumph TR7, new engine, 50,000 mile warranty, moon roof, AM/FM 8-track, Western mags, custom stripe, list price was $7390. 6 months old. Asking $5975. (415)793-9148.

- - - - -

For Sale: "65" Cadillac 4 DR Deville in fair condition. Good tires. Needs vinyl top repair – $150. Asking $800. For info. call Sal Tardio, 295-6852 after 4 p.m.

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For Sale – 1965 TR-SPITFIRE 4 Convertible. $400. Sal Tardio, 295-6852, San Jose.

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For Sale: 1966 Mustang. V8. $1700. 247-3333. O. Bolbol.

- - - - -

'69 Toyota Corona – Reblt. eng., R&H, AC, 4 speed. Good shape. Asking $600 or best offer. Call after 5 p.m. 272-2001, ask for Art.

Housing

For Rent: House Immac. 4 BR, 2 BA, fam. rm, 2 car gar, AEK, refrig, dshwshr, disp, new no-wax floors, new cpts and drps, lovely private yards, prime Palo Alto location, close to schools and Ames. Lse, $575 mo. Avail. 3/1. Call 321-1858.

- - - - -

Large furnished deluxe studio apartment in San Mateo near the Hayward-San Mateo Bridge on Mariners Island Boulevard; available February 1, 1977. Private garage, pool and recreation facilities; $220/month. George Lenehan, 343-9730 evenings.

SQUAW VALLEY RENTAL – Skiing with no traffic headaches. Fully furnished Condo. Sleeps 5. Three-minute walk to lifts. Call Ray Savin, 965-2170.

- - - - -

Home for Sale: SPACIOUS MILPITAS 4 BR home in quiet area, featuring 28x13 living room w/fireplace. Air cond., forced air heat, w/w carpets, 25' D'boy pool. $55,750 Owner, 263-8625.

Miscellaneous

For Sale: 75mm Minolta El Rokkor enlarging lens. $45. 3 ea. 4-reel Nikkor developing tanks, $3 (for all 3). 651-9540, V. Yearwood-Drayton.

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For Sale: Boys & Girls 5-spd bicycles, Sears. Make offer. 251-0239.

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For Sale: Firewood, Eucalyptus, $75/cord, $40/½ cord. Delivered. 948-5968.

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WANTED: Small upright or spinet piano, 322-1463.

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Heavy duty drk. brn. vinyl chair, like new, good looking, comfortable, relaxing, $70. Call 321-1858.

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Auto for Sale: 61 Sunbeam Alpine Rdstr. Very good mech. & in appearance. Also 2nd rebuildable or parts car. $1000/offer. 263-8625.

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Persian rug with pad, 9x12, pretty, colorful, like new. $150. Call 321-1858.

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Silver Bars. 100 oz. Call Bill O'Haren, 493-1874.

- - - - -

1971 Honda 350cc, good cond., reliable transportation, $395. 736-3984.

- - - - -

Toyota 71 Corona, 2 door, Automatic (rebuilt by AAMCO), 65K miles, good running condition, $950. Call 247-9549 after 6 p.m.

- - - - -

1973 Dodge Dart Swinger, 6 cyl., auto. trans., pwr steering, lt. gold, $2100. Call 984-5899 after 5 p.m.

- - - - -

For Sale: 1975 Pontiac Astre Hatchback. 20,000 miles. Green with black interior, 4 cyl. gas saver (23 miles per gallon). 269-1781 after 5 p.m. or 225-5113 before 4:30 p.m. Ask for Kendra Kelley, $3000.

- - - - -

For Sale: PLYMOUTH SATELLITE – 1969; A/T, R/H, Air Cond., Power Steering, Clean. $1050 or best offer. Phone 651-6757 after 6 p.m.

- - - - -

WANTED: Someone reliable, with references, to care for child in my home; San Jose, north valley near Milpitas. Temporary, for about 2 weeks. Call 259-7419, after 5 p.m.

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Car pool. One opening. White & Quimby. Evergreen area. Phone 238-3390.

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LACROSSE PLAYERS desiring to relieve the frustration and ease the tension of Government red tape should contact Herb Finger at 246-3616.

- - - - -

Planning a party? Live music is the "in-thing." We three girls known as the JEB Trio would like to perform for you. We can play all types of music for your dancing and listening pleasure. Reasonable. Contact: Joe (our agent) 739-6054.

- - - - -

For Sale: Dinette set – Custom made table and 6 chairs – white. Round table extends to seat 6. Clean, good condition. $75. 736-2696.

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The Astrogram

VOLUME XIX NUMBER 10

February 24, 1977

NASA and TV

NASA continues to receive a large volume of mail relating to commercially-produced space-oriented science fiction television and motion picture productions. Queries range from suggestions that the first Space Shuttle Orbiter be named the "USS Starship Enterprise" to "does NASA have a bionic man or woman?"

NASA is also asked why it doesn't design and launch spacecraft similar to those depicted on these shows, why its astronauts wear space suits and helmets, why they carry no arms and a variety of other technical and nontechnical questions. NASA, of course, is pleased that these programs generate interest in the NASA mission of conducting advanced aeronautics research and continuing the peaceful exploration of space.

It should be pointed out, however, that NASA is carrying out its mission using the tested resources and technology it has developed. The producers of the science fiction shows are not bound by these limitations – the "Star Trek" series, for example, deals with spacecraft and intergalactic missions which are far beyond humankind's present capabilities. NASA does not object to this form of entertainment – it *does*, however, point out that it *is* fiction.

Whenever asked, the Agency has provided technical advice to several shows. And in some instances actual film footage purchased from NASA has been incorporated in the shows. An example is the opening crash sequence in the "Six-Million-Dollar-Man" series. This and other motion picture and still photography in the NASA library is available for purchase by the public.

From its inception, the NASA program has been open, that is: all of its operations have been conducted in full view of the world's communications media, a policy the Agency continues to follow. NASA also produces its own audiovisual features which are distributed to radio/television outlets upon request. These are factual NASA historical presentations, identifiable by the NASA logotype at the opening and closing, indicating the presentation is documentary.

Because NASA has received so many letters suggesting the Space Shuttle Orbiter be names the "USS Enterprise" and inquiries on bionic research, the following information is made available:

First Shuttle Orbiter Named "Enterprise"

On September 8, 1976, President Ford names the first Space Shuttle Orbiter the "Enterprise." Rollout ceremonies for the test vehicle were held September 17, 1976, at the Rockwell International Company's Palmdale, California, plant. Several of the actors who appeared in the Star Trek television series were present at the rollout.

Bionic Research

NASA has not produced a robot or endowed a human with the capabilities attributed to the "Six-Million-Dollar-Man" or "The Bionic Woman." "Bionics," or bioelectronics, or biomedical electronics, refers to the study of or development of

(Continued on Page 2)

Last call for Shuttle applicants

NASA has received 1,147 applications for the Space Shuttle astronaut candidate program. Deadline for applying is June 30, 1977.

NASA announced last July that it was seeking at least 15 pilot and 15 mission specialist astronaut candidates. Successful candidates will report to Johnson Space Center July 1, 1978, for two years of training and evaluation. Final selection into the astronaut program will depend on satisfactory completion of the evaluation period.

Since NASA is committed to an affirmative action program with a goal of having qualified minorities and women among the astronaut candidates, NASA will make additional efforts to reach these groups.

To date 11,822 applications, forms and announcements have been mailed to requestors outside NASA. Another 350 applications have been sent to employees at the various NASA centers.

All received so far are from civilians. Applications from members of the military services will be provided to the NASA astronaut selection board just prior to the application deadline.

The majority of the requests for application forms and announcements have been for the mission specialist category. Of the 1,147 applications received, 922 are for mission specialist, 225 for pilot and 118 for both categories.

Pilot applicants must have a bachelor's degree from an accredited institution in engineering, physical science or mathematics or have completed all

(Continued on Page 2)

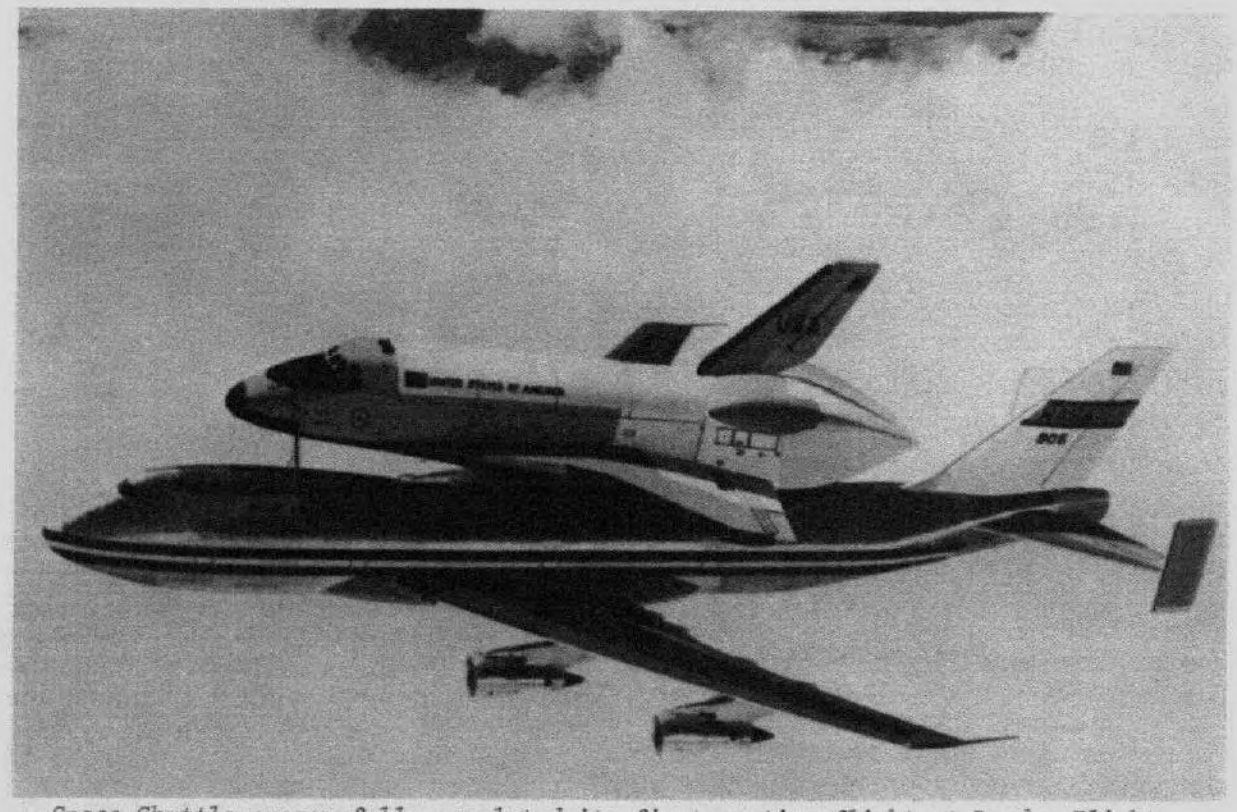
Dr. DeFrance to be honored

Dr. Smith J. DeFrance, retired director of Ames will be honored for his selection as an AIAA Honorary Fellow in a special ceremony on March 15, at 4:00 p.m. in the Ames Cafeteria. Dr. DeFrance is one of three persons selected for the Honorary Fellow status. Each year only two Honorary Fellows from the United States, and one outside of the United States, are selected by the Fellows of AIAA. Dr. DeFrance was named, "for his leadership in directing and building NASA Ames Research Center to a position of eminence in aerospace research and development."

Starting as an aeronautical engineer at Langley Field, Virginia, in 1922, Dr. DeFrance was responsible for design and construction of some of Langley's major research facilities. He became Director of the Ames Aeronautical Laboratory in 1940. Dr. DeFrance continued to lead the Center after it became affiliated with NASA as the Ames Research Center. Under his direction, the team at Ames made major contributions to Aerospace, among them were: the use of heat to overcome aircraft icing; aeronautical and theoretical research which led to the use of sweptback wings for high speed flight; and the blunt nose design which enables space vehicles to deal with atmosphere entry heating. Dr. DeFrance is a recipient of the Silver Star Medal, and the National Civil Service League Career Service Award.

All Ames personnel are encouraged to attend the honors ceremony.

Shuttle's first liftoff test



Space Shuttle successfully completed its first captive flight at Dryden Flight Research Center last Friday, February 18.

Safety Corner - Blood donor information

A revised brochure entitled "The Permanente Medical Group Blood Transfusion Program For Members Of The Kaiser Foundation Health Plan, Inc." will be issued shortly by the Kaiser Foundation. The following paragraph is a quotation from the revised brochure. Changes from the original brochure are in italics for your convenience.

"Your Kaiser Foundation Health Plan does not cover blood required for transfusions. Blood must be replaced or a charge of up to *$35.00* will be made for each unreplaced unit. *EXCLUDED from this charge are whole blood or packed red cells transfusions performed in Kaiser Foundation Hospitals located in Santa Clara County; however, a charge may be incurred for blood products other than whole blood and packed red cells.* A special program is available to Health Plan members so that they may avoid these charges for transfusions in Kaiser Foundation Hospitals in Northern California. Through this Blood Transfusion Program members may donate one pint of blood and cover most of the transfusion needs of an entire family for one year – an individual for two years – for any condition that arises AFTER enrollment in the program. Many conditions that exist PRIOR to enrollment will also be covered. A list of such conditions is available upon request. *If, by reason of age or health, a member cannot donate blood, an annual premium of $25.00 may be paid to the Health Plan in lieu of a donation, or a relative or friend may make a one-time annual donation in the member's behalf, citing the member's Health Plan identification number.*"

Under provisions of an agreement between the Central California Regional Red Cross Blood Program and the Kaiser Foundation, the Red Cross Blood Program will accept designated donations in behalf of a Kaiser member who is not a member of the Blood Transfusion Program in order to enable the Kaiser Health Plan member avoid the extra charges described above when the member has received transfusions of whole blood or blood products. To facilitate identification and application of proper credits the Kaiser Foundation requests that persons making designated donations in behalf of a Kaiser Health Plan member furnish the member's name, Health Plan identification number, if known, and the name of the Kaiser Hospital in which transfusions took place.

As a result of an American Red Cross national policy change, Donor Clubs (now referred to as Donor Groups) no longer accumulate "credits" which may be transferred in behalf of Donor Group members or other parties. This policy change in no way affects the supply of blood or blood products in Kaiser Foundation Hospitals; they will be available in sufficient quantity as before. All that is now required is that *one* Donor Group member make a designated donation in the member's behalf to enroll that member in the Blood Transfusion Program in advance of the transfusion, or that group members make designated replacement donations on a one-for-one basis after the transfusion takes place.

Dead storage hours

To ensure that warehouse personnel handling dead storage are available for prompt receipt and pickup of dead storage property, the following HOURS OF OPERATION are hereby established: Monday, Wednesday, and Friday – 12:30 p.m. to 3:30 p.m. This schedule is effective February 28, 1977, and does not apply to emergency situations. If it is necessary to pickup an item or to place an item in storage under emergency conditions, then contact Chief, Supply Branch, who in turn will arrange for a warehouseman to be available for immediate action.

NASA and TV

(Continued from Page 1)

electrical or electronic devices for use in physiological measurements (such as heart rate, electrocardiogram, respiration rate, body temperature), biochemical measurements (such as blood and urine electrolyte and hormone concentrations), prosthetics and human augmentation (such as artificial limbs and artificial organs, sensory aids to the deaf and blind), and other areas of biomedical research and clinical medicine. "Bionics," as it is most popularly used today, usually refers to areas such as robotics, artificial limbs, artificial organs, and computer control of systems to augment or replace the human operator.

NASA has done work in all of the areas mentioned above. Most of this work has been in the development of biomedical instrumentation for physiological, psychological, and biochemical measurements on man and other animals during space flight or space flight simulation. However, a substantial amount of NASA research and development effort has also gone into the areas of teleoperators and remote manipulators. These are "arms" and "hands" which may be remotely controlled, are programmable, macro- or micro-systems, capable of moving and manipulating very large, heavy objects, such as earth orbiting satellites from the Space Shuttle, or very small objects such as minute samples of a radioactive ore from its protective container to a measurement chamber. Technology resulting from NASA's involvement in teleoperator and control systems development has been applied to solving problems of the handicapped.

Export control

In the event that you, as a former NASA employee, take a professional position as an aerospace expert dealing with or for private industry abroad or foreign governments, you will be subject to the International Traffic in Arms Regulations (ITAR) administered by the Department of State. Under these regulations certain types of *unclassified* technical information requires an export license before it may be disclosed in any manner to foreign nationals.

The U.S. Munitions List of the ITAR sets forth categories of items which require an export license. Practically all space and advanced aeronautical equipment is covered by one or more of these categories.

The export of *unclassified* technical data is also subject to licensing. The ITAR defines the export of "Technical Data" (summarized) as "oral, visual, or documentary disclosure of unclassified information that can be used for the design, production, manufacture, repair, overhaul, processing, engineering, development, operation, maintenance, or reconstruction of items on the Munitions List, or that information which advances the state-of-the-art."

Thank you

We want to extend our heartfelt gratitude to all of Bonnie Malmos' friends at Ames for all of the love and concern shown during her illness. A special "Thank You" to the wonderful people who donated blood on her behalf. We pray that your donations, in her name, to the Oral Roberts University Medical Building Fund will help in finding a cure for cancer. God bless each and every one of you.

The Hays Family

CET exam

Electrical and Electronic Technicians should begin preparing for the May, Certified Engineering Technician (CET) examination which has been sponsored by the National Society of Professional Engineers since 1961. The 6-hour exam covering mathematics and basic engineering principles will be given at 3 locations in the Bay Area. A preparatory course for the exam begins March 3.

CET status is recognized nationally; recertification is not necessary in another state. Certification is the only official recognition of ability, achievement, and professionalism available to ET's. It is required by many employers of Electrical Engineering Technicians, and may enable ET's to bypass preemployment exams.

Applications to take the CET exam will be available at the first meeting of a comprehensive review course designed to thoroughly prepare ET's for the exam. The course is administered by Michael R. Lindeburg and the Professional Engineering Registration Program, with the sponsorship of the Peninsula Chapter, California Society of Professional Engineers.

Shuttle

(Continued from Page 1)

requirements for a degree by Dec. 31, 1977. An advanced degree or equivalent experience is desired.

They must have at least 1,000 hours first pilot time, with 2,000 or more desirable. High performance jet aircraft and flight test experience is highly desirable. They must pass a NASA Class 1 space flight physical and be between 64 and 76 inches in height.

Applicants for mission specialist condidate positions are not required to be pilots. Educational qualifications are the same as for pilot applicants except that biological science degrees are included. Mission specialist applicants must be able to pass a NASA Class 2 space flight physical and be between 60 and 76 inches in height.

Civilian applicants may obtain a packet of application material from JSC. Requests should be mailed to either Astronaut (Mission Specialist) Candidate Program or Astronaut (Pilot) Candidate Program, Code AHX, NASA Johnson Space Center, Houston, Tex. 77058.

Military personnel should apply through their respective services using procedures announced by the Department of Defense. Military candidates will be assigned to JSC but will remain in active military status for pay, benefits, leave and other military matters.

Credit Union news

A dividend of 6-1/2% per annum was declared by the Moffett Field Employees Credit Union according to John F. Pogue, President of the Board of Directors. This quarterly dividend was added to members' accounts on 1 January 1977 for money on deposit as of 31 December 1976.

In October Moffett Field Employees Credit Union announced a 90-Day New Car Special. We are happy to announce this new car special has been extended until 1 April 1977. Any passenger vehicle purchased during this time will have repayment period of 48 months, 90% financing and 10% APR!!! Moffett Field Employees Credit Union's new car loan special includes loan protection insurance on members loan balances up to $10,000 at no additional cost to the borrower. Also low cost disability insurance is available for purchase. Prospective car buyers should remember that MFECU charges interest only on the decreasing loan balance and there is never any prepayment penalty.

FPC Scholarship deadline 4-1-77

Ten or more $500.00 Scholarship Awards will be given to outstanding high school graduates, to be paid to the winners upon their enrollment in a recognized junior college or accredited college or university. Selections will be announced at a luncheon in May.

(1) Must be the son or daughter of a career civilian employee presently employed in a Federal agency in Northern California; *or* (2) the son or daughter of a retired or deceased career civilian who was employed by a Federal agency in Northern California at the time of retirement or death; *or* (3) currently employed in a Federal agency in Northern California under the President's Stay-in-School campaign; *or* (4) have been employed during the summer of 1976 under the Summer Youth Opportunity Program; *and* (5) a high school senior graduating in January or June 1977 (or between those dates). Northern California includes Monterey, Kings, Tulare, Inyo and all areas in California north of these counties.

The bases of awards include the following:

Scholastic Ability – based on high school record and results of scholastic aptitude tests of the College Entrance Examination Board.

Leadership Potential – based on application and letters of recommendation.

Essay – based on submission of a 1200 word essay entitled "What Equal Employment Opportunity Means to Me."

Application procedures include:

(1) Obtain application from agency or, if not available, from address below.

(2) Send application to the address below postmarked no later than *April 1, 1977* with:

a. A copy or photostat of your high school transcript(s) as of December 1976, showing hours of credit for each course, grade, date of completion *and* results of your CEEB test. This may be shown on transcript.

b. Two letters of recommendation from Teachers, Counselors or Principals.

c. An essay of approximately 1200 words on "What Equal Employment Opportunity Means to Me."

Send application to:

Mr. Donald G. Parks
Personnel Officer
U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

Notice

Coming this spring on PBS: The Cousteau Society presents "Oasis in Space," a new series of half-hour specials. Join Philippe and Jacques Cousteau as they explore some of the most fascinating, and disturbing, questions that face the inhabitants of our planet – as they study problems and search for solutions related to food, water, energy alternatives, industrial pollution, population, and the future.

What Price Progress? – February 22
Grain of Conscience – March 1
Troubled Waters – March 8
Population Time-Bomb – March 22
The Power Game – March 29
Visions of Tomorrow – April 5

Begins February 22 on most PBS stations. Check local listings for the times in your city.

EEO

Any employee interested in a copy of the Center's Affirmative Action Plan for FY77/78 call the EOP office, ext. 5626.

ACE spring televised courses

TELEVISED COURSES
Spring, 1977

Professional Skills		
Microwave Tubes & Solid State Devices	MWF	12:00 – 1:00 PM
Database Management Systems	MW	12:00 – 1:00 PM
Manufacturing Quality Control	TTh	12:30 – 1:00 PM
Beginning Business Math	TTh	12:00 – 1:00 PM
Government Contracts Administration	T	5:00 – 6:45 PM
Tools for Making Better Cash Investment Decisions	TTh	12:30 – 1:00 PM
Management of Technological Innovation	TTh	12:00 – 1:00 PM
MBA Foundation		
Management & Organizational Behavior	M	5:00 – 6:45 PM
Planning & Operations Management	W	5:00 – 6:45 PM
Principles of Financial Management	T	5:00 – 6:45 PM
Introduction to Profitability & Statistics	Th	5:00 – 6:45 PM
Supervisory Skills		
Introduction to Accounting	MW	12:00 – 1:00 PM
Selected Topics in Supervision	T	5:00 – 6:45 PM
Principles of Effective Business Writing	W	5:00 – 6:45 PM
Personal Development		
Creative Problem Solving	MWF	12:00 – 1:00 PM
Personal Money Management	MW	12:00 – 1:00 PM
Effective Reading	MW	12:00 – 1:00 PM
Time Management	TTh	12:00 – 12:45 PM
Communicating Successfully	TTh	12:00 – 1:00 PM

Instruction begins Monday, March 28

Kassner receives Special Achievement Award

Don Kassner of the Ames Experimental Investigations Branch was recently presented a Special Achievement Award for his alertness in recognizing a potentially dangerous error in some of the stock high pressure pipe fittings.

While installing some 3000 psi high pressure hose in the 11X11 Foot Wind Tunnel in support of the F-18 model test, Mr. Kassner required some high pressure pipe nipples of various sizes. Upon inspection, Mr. Kassner discovered that the fittings furnished were not suitable for 3000 psi service according to Sections 1 and 5 of the Code for Pressure Piping. Use of these pipe nipples could have resulted in a serious accident with the possibility of personnel injury. His alertness quite probably prevented a potentially serious accident.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-40	Secretary (Typing)	GS-5/6	SP	Centerwide	3-4-77

TO APPLY: Call Extension 5599 or 5600.

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-135T	Supervisory Aerospace Engineer	LB	James Prim

Missing

These two books were checked out of the main Library; name, mailstop, and ext. were omitted. If you have please call the library, ext. 5157.

FASTCAT QA 20105 – Title: Microprogrammable computer architectures.

FASTCAT QA 23397 – Title: Computer organization and microprogramming.

Thank you

We want to thank all our friends for their gifts and attendance at my retirement party.

We expecially appreciated the projection table which we used right away to look at the slides from my European trip.

Sincerely,
Jack, Rosie, Linda, and Michael Mellenthin

Fastpitch softball

The NASA Ames Fastpitch Softball Team will start practicing for the 1977 softball season. Interested players contact Bruce Ganzler, x5943.

Albacore fishing

All those persons who might be interested on albacore fishing this year some time between August and October and want some information about a charter trip please contact André Bogart on ext. 5560. The only time you can't reach me is between 7:30 and 8:30 on the mornings of 8, 10, 11, 15, or 17 of March. I already have 12 people signed up and only need another 10.

Want ads

Transportation

FOR SALE: '72 Mustang, V8, pwr steering. $2075. 259-7419.

– – – – –

FOR SALE: BMW 2002 '76, metallic grey w/tan int., 4-spd, 22k mi, exc. cond., $6900. Poss. assume lease, 493-8400, 941-8899.

– – – – –

FOR SALE: 1976 19.5-ft mobile Traveler recreation vehicle. GMC truck body loaded with extras including PS, PB, A/C, cruise, stereo. Completely self-contained. A bargain at $9300. Call Dick Gemoets at 735-0635 for further information.

– – – – –

FOR SALE: 1975 Volvo 242 Grand Tuxe. This is Volvo's most deluxe 4-cyl model. Has many extras including PS, PB, A/C, leather upholstry, full stereo, sunroof, low mileage (28,000 miles left on 50,000 mile warranty), plus all the standard Volvo "extras." Please call Dick Gemoets at 735-0635, ext. 252, for further information.

– – – – –

FOR SALE: 1966 (V8) Mustang. In exc. cond. Recently painted. $1200. O. Bolbol. 247-3333.

– – – – –

FOR SALE: 1975 Chev. Monza 2+2, AM/FM radio, air cond., needs body work, $2000/offer, 967-0881.

– – – – –

FOR SALE: '62 classic Porsche hard top, $3,300. Phone 286-2565, ask for Beverly.

– – – – –

FOR SALE: 1976 Buick Regal, all power, w/air cond., pewter silver/burgundy vinyl top. Call after 7:00 p.m. 578-3742.

Housing

Alpine Meadows – week or weekends, Swiss Chalet cabin at North Shore, Lake Tahoe, AEK, dishwasher, 2 bed, 2 bath, sleeps 7. Call 739-5373 after 5:30.

For Rent: Eichler, immac. 4 BR, 2BA, fam. rm., 2 car gar, AEK, refrig, dshwshr, disp, new no-wax floors, new cpts and drps, lovely private yards, prime Palo Alto location, close to schools and Ames. Lse, $575 mo. Avail. 3/1. Call 321-1858.

– – – – –

House for rent: Milpitas, 3 BR, 2 BTH, fireplace, refrigerator. Close to 237 and 17. $340/month. Phone 493-1874 after 4 p.m.

Miscellaneous

FOR SALE: 15-ft fiberglass Corsair ski boat w/100 HP Mercury motor, and trailer, exc. cond., $1200. Call after 7:00 p.m. 578-3742.

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FOR SALE: Capehart stereo console w/8-track tape, turntable, exc. cond., $125. Call after 7:00 p.m. 578-3742.

– – – – –

FOR SALE: Boys Motorcross bike. Webco frame, Red Line fork, nylon rear wheel, heavy duty front. $55/offer. 738-2948.

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FOR SALE: 9x12 orange shag rug, 1 yr old, exc. cond. $50; 11x13 black and white short shag rug, 1 yr old, exc. cond. $75; 40 plus yards gold shag carpeting, 2 yr old, $200; rubber padding $50; ladies size 12 brown suede short jacket, fur collar and cuffs, quilted satin lining, worn once, $50. Phone 263-4418.

– – – – –

FOR SALE: Hide-a-bed, double, blue, in fine condition. $150. Earl Menefee (408)243-5382.

– – – – –

Craftsman electric motor, ¾ hp, 115 volt, 3450 rpm, dual shaft, asking $35. 326-7492.

– – – – –

Skis, poles, and Saloman bindings, used only 4 times, $45. 326-7492.

– – – – –

Ski boots, German-made, size 11, molded plastic, buckle-type, $20. 326-7492.

– – – – –

Snow chains, sizes 8.50-14, 8.55-14, 8.45-15, 7.60-15, 215-R15, 215-R14, 205-R15, F70-15, G70-15, never used. $10. 326-7492.

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Persian rugs for sale: 4½x6½ ft Torkeman, very high quality, $500; 3½x4½ ft Kashan, medium quality, $200; 2x3 ft Torkeman, very high quality, $50; 2x3 ft Tehran, low quality, $25. Call Bijan (NRC leaving U.S.) at 964-8067.

– – – – –

Patio furniture – Homecrest chaise and chair with ottoman, both pieces are swivel rockers. $100.00. Hank Asch, 996-7009.

– – – – –

FOR SALE: Camper, wooden, fits ½-ton, short-bed, pickup. Good condition. $75. 967-0896.

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Persian rug with pad, 9x12, pretty, colorful, like new. $150. Call 321-1858.

– – – – –

Sofa chair, heavy duty drk brn Vinyl upholstry, like new, good looking, comfortable, relaxing, ideal for family room/den. Can be used in living room. $70. Call 321-1858.

– – – – –

Dining chairs, set of 6, made of wood, drk walnut color with heavy duty black Vinyl seats. Very impressive, excel. cond. $125. Call 321-1858.

– – – – –

VW Campmobile – I would like to rent VW pop-top camper for a few days. Thinking of buying and want to try one out first. Dennis Cunningham. 255-7408.

– – – – –

Handcrafted Burl Coffee Table – Stained & finished. Will enhance any living room. Must see to appreciate. $350/best offer. Call 266-8362 (after 6:00 pm).

NASA
National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035
AC 415 965-5000

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The Astrogram

VOLUME XIX NUMBER 11 March 10, 1977

Kuiper Airborne Observatory begins first international mission

Ames' C-141 Kuiper Airborne Observatory aircraft will be high over the Indian Ocean about 2,000 kilometers (1240 miles) southwest of Australia so it can observe the planet Uranus as it passes in front of a star on March 11.

As the planet moves between Earth and the star, the starlight will be bent and partially absorbed by the planet's atmosphere and finally blanked out. By knowing precisely what happens to the starlight, a scientific team headed by Dr. James Elliott of Cornell University expects to be able to improve the knowledge about the composition and height of the Uranus atmosphere and get a more exact measurement of the planet's diameter and shape.

The Uranus occultation is a rare astronomical event and offers a unique scientific opportunity to reduce the uncertainties about what little is known of the planet. Like its outer planet sisters, Neptune and Pluto, Uranus is so distant that it is difficult to measure its physical characteristics. It is 2.856 billion kilometers (1.785 billion miles) from the sun and completes one orbit around the sun every 84 years. It was accidentally discovered by Sir William Herschel in 1781.

The flying observatory, names after famed astronomer Gerard P. Kuiper who discovered one of Uranus' five satellites in 1948, will be based at Perth, Australia for the occultation mission after departure from Ames, March 3, and fuel stops at Honolulu, Pago Pago, and Melbourne.

The mission, the first international expedition for the aircraft, will continue with a Melbourne-based series of infrared observations of Southern Hemisphere skies. For these flights, the University of Melbourne and the Australian National University are conducting a joint observing program with experimenters from the California Institute of Technology. Investigators from Steward Observatory at the University of Arizona and the Yerkes Observatory at the University of Chicago will also do infrared astronomy experiments.

The principal investigators and team leaders from the United States are J. L. Elliott, Cornell University; M. W. Werner, California Institute of Technology; D. A. Harper, Jr., University of Chicago; and W. F. Hoffmann, University of Arizona. The principal Australian investigators are A. R. Hyland, Australian National University, and J. A. Thomas and G. Robinson of the University of Melbourne. The Mission Manager for this C-141 expedition is C. M. Gillespie, Jr. of Ames.

Secretaries Week:

Tuesday, April 26, 1977 (7:30 – 9:00 a.m.)

Secretary/Executive Breakfast, in observance of Secretaries Week, co-sponsored by the National Secretaries Association, and the Employees Advisory Groups of NASA-Ames Research Center.

Buffet breakfast at Ames Cafeteria – including Quiche Lorraine! Good food, keynote speaker, more information later.

Correction

March 29 – "Man's Reach Should Exceed His Grasp" (1971). This is the 23-minute story of flight and of our reach for a new freedom through aviation and the exploration of space. From the Wright Brothers flight at Kitty Hawk to the landing on the Moon and future missions to the planets, the film depicts the fulfillment of our ancient dream of flight.

Ames Lear participates in Project Porcupine

The Ames Lear Jet equipped with a 30 cm (12 inch) infrared telescope will be based in Greece this spring to participate in an international study of the coupling between the earth's magnetosphere and ionosphere.

The Study, called Project Porcupine, is directed by the Max-Planck Institut für Physik und Astrophysik, Munich, West Germany. It will use an Aries sounding rocket equipped with 11 experiments which will be launched from Esrange (Sweden). At about 450 km (270 miles) altitude, a barium shaped charge will be ejected. The sunlight will ionize the barium, making it visible.

The barium ions will become trapped in the earth's magnetic field and will travel along the magnetic lines of force, reentering the earth's atmosphere at the conjugate point in the Antarctic.

The barium trail will rapidly fade, so that it can only be observed with the most sensitive optical instruments.

For Project Porcupine, the Lear Jet telescope will be equipped with instruments furnished by the University of Alaska. The aircraft will fly along a flight path which will allow continuous optical coverage of the barium trail against a star background for approximately the first 1,000 seconds after release.

The aircraft will be based at Athens International Airport. It left Ames Research Center on Feb. 27 for the ferry flight to Greece, flying by way of Canada, Greenland, Iceland, England, and Italy. It will return via the same route following completion of the project, expected prior to the end of March.

ARC and Goddard co-host ITEST

On March 12, 1977, Ames and Goddard Space Flight Center will host the Institute for Theological Encounter with Science and Technology (ITEST) in cosponsoring a program entitled "The Limitations of Science in the Solution of Social Issues." There will be two speakers at NASA Ames and two speakers at NASA Goddard. The presentations will be carried live via Experiment 18 on the Communications Technology Satellite (CTS). Time: 11:00 a.m. to 3:00 p.m.

There is a very profound and complex interaction between a society's culture and its scientific-technological enterprise. The cultural needs and desires of a society determine its technology while the developing or developed technology in turn affects and sometimes effects cultural continuity. There are many serious social issues in our society that have significant science-technology components or have their origins in scientific developments.

These issues include, among others, the energy crisis in its many elements, the invasion of privacy threatened by sophisticated surveillance techniques and computerized data banks, research and technological advances in reproductive biology, brain physiology, and so on. There are questions of transportation, environmental concerns, population management, arms control, the implications of mass communications, etc. There is a growing demand to set national social priorities and to establish governmental agencies to assess technology and, most recently, a scientific "supreme court" has been recommended.

The question of the role of science in the approach to social issues is significantly important to our society – too significant to leave unexamined. The uses or abuses of science in these areas will affect the lives of all of us.

The conference, in addition to providing stimulating speakers on a topic of great interest and concern at this time, will also provide an opportunity to observe the potential uses of the CTS satellite. At the present time, Stanford University and Carlton University, Ottowa, Canada; The Southern Education Communications Association and the Archdiocese of San Francisco are among the Experimenters utilizing the CTS.

Persons planning to attend the conference are asked to please notify

NASA Educational Programs Office 204-7
NASA Ames, ext. 5544

Attendees are requested to use Gate 18 on entering the center and to then proceed directly to the Auditorium, Building 201. The gate opens at 10:00 a.m.

The TV net of the San Francisco Archdiocese will also carry this conference to some 75 schools in Northern California for viewing by educators, religious, and civic leaders.

THERE IS NO REGISTRATION FEE.

NASA awards solar energy patent

NASA has awarded an exclusive patent license to Owen Enterprises, Inc., Wilmington, Calif., for production of a unique solar energy concentrator that focuses the Sun's rays from almost any angle without the need for a Sun tracking mechanism. The device was invented by Dr. Katsunori Shimada of NASA's Jet Propulsion Laboratory and patented by NASA.

Owen Enterprises, Inc., is an American Indian-owned firm. Final assembly of the device will be accomplished at facilities on the Rincon Indian Reservation near Escondido, Calif.

Under terms of the patent license agreement, Owen Enterprises will invest $200,000 to develop the device for the market. In addition, after production begins in about six months, the firm will pay a one percent royalty of its gross sales to the U.S. Treasury.

The solar energy concentrator is a long, narrow device consisting of a special arrangement of multi-faceted Fresnel lenses that magnify the Sun's energy 10 times, much like a magnifying glass. Each facet of the lens acts as a small prism which concentrates solar energy on one of a series of heat collector elements. The concentrated sunshine heats a fluid located in channels beneath the lenses. The fluid, water, ethylene glycol, or other suitable liquid, is released through a thermostatically controlled valve when the proper temperature is reached. A series of the devices can be hooked together, depending on the specific energy requirements of a structure.

With its concentrating capability of 10 to one, the solar energy concentrator has a much higher efficiency than solar collector units now on the market. It can be used for residential, commercial and industrial applications.

Owen Enterprises, Inc., is located at 436 North Fries Avenue, Wilmington, Calif. 90744.

NASA does not endorse commercial products developed as a result of its Patent Licensing or Technology Utilization Programs, but it does encourage the widest possible use of its technology.

A photograph to illustrate this news release will be sent without charge only to media representatives in the United States. It may be obtained by writing or phoning:

The Public Affairs Audio-Visual Office
Code FP/NASA Headquarters
Washington, D.C. 20546
Telephone No.: 202/755-8366
Photo No.: 76-H-893

NASA helps detect heat loss

Excessive loss of household heat creates financial hardship for homeowners and is a waste of precious fuel. But how do you determine whether your home is losing too much heat?

Lewis Research Center has agreed to participate in programs in Cleveland, Ohio and Springfield, Ill. designed to demonstrate the feasibility of using an airborne infrared scanner to identify residential heat loss.

At the request of Cleveland's Department of Community Development, a NASA C-47 aircraft will fly over demonstration areas on the city's east and west side. These special demonstration residential areas were selected from target areas designed by the Cleveland City Council. Residents there are eligible for low-interest winterization and rehabilitation loans from Housing and Urban Development.

The infrared thermal scanning unit onboard the aircraft flying at 1000 feet is able to view a one-half mile wide swath. Data are recorded on magnetic tape and later processed into a picture-like image.

The thermal infrared image shows hot areas as white, warm areas as gray, and cool areas as black. It is possible to determine which homes are losing too much heat by the degree of brightness of rooftops.

When this demonstration flight has been completed, residents of the target areas may go to their local community center or other specified area to view the imagery and to hear about the Cleveland Winterization Program. If a homeowner finds that his home is losing too much heat he will have the opportunity to apply for a low interest block grant rehabilitation loan through the Department of Community Development.

Friends Outside seek volunteers

Friends Outside of Santa Clara County, a United Way Agency, is seeking help from men and women in industry who are interested in becoming tutors or in developing a one-to-one relationship with a school-age child. Founded 22 years ago to aid the families of men and women in our county and state prisons, Friends Outside has tried to provide the children in these families with "volunteer friends" for a number of years. These two are perhaps the most vital of the youth programs.

These children live in homes, in many cases no more than 15 minutes away from your own, yet they come from a world of tragically limited horizons. They are children without a future – unless they receive help from the outside.

Volunteers in our programs can offer these underprivileged children something more than homework assistance; they can give the youngsters contact with the successful world which relieves their psychological poverty. Getting to know these families can be a rewarding experience for volunteers, too.

Tutors help children with their school problems either at the family home, at the library, or at Friends Outside. Volunteer tutors often work in pairs with all school-age children in a family for 2 hours each week. They are encouraged to work as closely with the children's mothers as is possible.

Our *One-to-One Program* emphasizes the development of a "big brother" or "big sister" kind of relationship with a troubled or lonely child between the ages of 8 and 13. Each volunteer is encouraged to see "his" child for at least 4 hours each week, on weekends, afternoons, or evenings. It is hoped that volunteers in this program will develop lasting friendships with these children.

The youth programs are only part of the work of Friends Outside, an organization with over 600 volunteers. Friends Outside also has programs to aid the inmates of the county jails, distraught mothers, and older school children.

Many Ames employees have participated in this community effort during the past years. Won't you help continue this association?

If you are interested in becoming involved, please contact:

David Gibson, Youth Director
Friends Outside
712 Elm Street
San Jose 95126
Tel. 295-6033

Safety corner: New seat belt ruling

The following article is submitted for your information. A copy of the ruling may be obtained from the Safety Belt Usage Branch, National Highway Traffic Safety Administration, U.S. Department of Transportation.

Disuse of Belt Curbs Claim in Injury Suit

An appeals court has ruled that a person injured in a automobile crash may be limited in recovering damages if he failed to wear a safety belt.

The New York Times reported that the New York State Court of Appeals in Albany upheld the action of a jury which disallowed a damage claim by a woman who was ejected from her car equipped with seat belts which she was not using.

The plaintiff, Alyce Spier of Madison County, N.Y., was flung from her car after a tractor-trailer attempted to pass and struck her vehicle. The court, in reviewing Spier vs. Barker, last week held in effect that the failure of the plaintiff to strap herself in "resulted in increasing the extent of...injuries and damages."

Shuttle visitor activities

Beginning in May, the Space Shuttle Orbiter will initiate a series of manned captive flights continuing through June at DFRC. The manned Orbiter will be launched from the 747 for the first time in July.

Special viewing areas have been designated on Edwards Air Force Base so that the general public can witness these flights. These areas are limited in size. Only those vehicles displaying the approved parking pass for a particular flight will be allowed to enter the base and park in these special areas.

To receive an invitation to view a flight, more information on specific flight dates and a parking permit, those interested should write to Dryden Flight Research Center, Box 273, Edwards, CA 93523, Attn: ALT Spectator Control, or to NASA Headquarters, Attn.: Public Services Division, Code FG, Washington, D.C. 20546.

A NASA Visitor Information Center will open the day prior to tests in Lancaster at 43713 20th Street West adjacent to the Avenue "K" off-ramp of the Antelope Valley Freeway. Phone number there is (805) 948-0721.

Early Shuttle "Getaway" signups

NASA has signed up the first four customers for small, self contained payloads for flight aboard Space Shuttles on a space available basis beginning in 1980.

The payloads, termed "getaway specials" by Associate Administrator for Space Flight John F. Yardley, weigh 90 kilograms (200 pounds) or less each, measure less than 0.15 cubic meters (5 cubic feet) are for research and development purposes and require no additional Space Shuttle services such as electrical power or deployment in space.

Cost of the service will be negotiated based on size and weight of the package but will not exceed $10,000 in 1975 dollars. Minimum charge will be $3,000 also in 1975 dollars.

Each of the four customers who have signed up for the "special" have deposited $500 earnest money with NASA. This money will be applied to the final cost of the service.

The four customers in order of signing are:

R. Gilbert Moore, a private citizen from Utah, who plans to place research equipment in his "getaway special." He has offered half of his payload to Utah State University which in turn will offer the space to selected high schools for students to submit proposals to fly their own experiments. Selected students would be given tuition waivers at Utah State and have the opportunity to earn some additional money by working with faculty members involved in space sciences.

Dr. L. R. Megill, Chairman of the Space Science Experiment Committee at Utah State personally will fund a $3,000 payload as a follow-on to Moore's. He also plans to invite students to submit proposals.

Reiner Klett, a German consultant representing independent German researchers, has signed for two $10,000 payloads. One of these will be for a space processing experiment and the other for a biological experiment.

Battelle Memorial Institute has purchased two $10,000 payloads to be used in the field of materials science.

NASA also is seeking customers for larger payloads for Space Shuttle missions. The agency is negotiating with Comsat Corporation to fly three missions to place Intelsat V communications satellites in Earth orbit.

Shuttle tests begin exactly 15 years after Glenn's first orbit

Fifteen years ago, the United States placed its first man in Earth orbit.

In the decade and a half since Marine Lt. Col. John H. Glenn made his historic three-orbit space flight in Friendship 7, Feb. 20, 1962, U.S. space program has progressed to the point where it is beginning flight tests of the first of a planned fleet of five reusable space vehicles.

Almost to the anniversary day of the Glenn flight, the first Space Shuttle Orbiter, named Enterprise, left the ground Feb. 17 on the back of a jet airplane for its first trip through Earth's atmosphere.

Where Glenn's trip into space was in a one-man capsule in a mission designed to find out if man could travel successfully through space and survive, the Space Shuttle is designed to give people routine access to space and to use and exploit space for the benefit of mankind.

Glenn's trip into space lasted less than five hours. Two earlier sub-orbital space missions by Astronauts Alan Shepard and Virgil I. "Gus" Grissom accumulated a half hour of space flight experience.

Now as the Space Shuttle Orbiter completes its first captive flights aboard a Boeing 747 aircraft, the United States has a background of 22,504 man-hours in space flight, accumulated by 43 astronauts on 31 separate manned missions, including nine trips around the Moon, six landings on the Moon and earth-orbital missions of three months.

This experience has demonstrated that people can survive space journeys and weightlessness for long periods and they can work effectively in space. NASA space exploration also has shown that the space environment offers advantages to be used for the benefit of people on Earth.

Glenn's Mercury spacecraft weighed 1,315 kilograms (2,900 pounds), barely had enough room inside for Glenn and a few instruments, and was designed for one-time use. It landed in the Atlantic Ocean by parachute.

The Space Shuttle Orbiter, by contrast, weighs 67,500 kg (150,000 lbs) empty, has room for up to seven crewmen and a cargo bay capable of handling payloads of up to 29,480 kg (65,000 lbs) and as large as 4.5 meters by 18 meters (15 ft by 60 ft). It will glide to a landing on a runway and be prepared for use again in a few weeks.

While the Space Shuttle Orbiter will be manned in the sense that it will have a crew, many of its missions will be flown to place in orbit automated satellites that today are launched by expendable vehicles. Many of its missions will carry Spacelab into orbit. Spacelab is a large laboratory manned by up to four scientists and technicians to carry out experiments in Earth orbit. Spacelab missions will last seven to 30 days with Spacelab being returned to Earth after completion of a mission.

Fifteen years ago John Glenn made an exploratory three-orbit flight to probe the mysteries of space. Today the NASA Space Shuttle Orbiter is ready to take its first short flights in a program to exploit the no-longer mysterious resources of near-Earth space.

The first of six Earth-orbital flight tests of the Space Shuttle is scheduled for 1979 and the first of hundreds of operational flights is scheduled for 1980.

Special Achievement Award for Rogers

James R. Rogers of the Ames Airworthiness Assurance Office was presented a Special Achievement award for his efforts in the development and preparation of the publication "Crash Rescue and Survival Handbook." The handbook contains photographs of all Ames' aircraft showing the exterior rescue markings and describing how each can be opened. The publication evolved after the crash of Ames' Convair 990 Galileo in 1973 highlighted the need for improved aircraft exterior rescue markings. It is now carried aboard each aircraft and a copy is given to the airport manager upon the arrival of an Ames plane. "CRASH" has received favorable comment from the other NASA Installations as well as from various other Federal agencies.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-41	Electronics Engineer (AST, Data Systems) or Mathematician (AST, Data Analysis)	GS-11/12/13 GS-11/12/13	FAE	Centerwide	3-25-77
77-42	Secretary (Typing)	GS-4/5	FSV	Centerwide & outside	3-18-77
77-44	Accounting Technician (GO)	GS-4/5/6	AFC	Centerwide	3-18-77
77-45	Supervisory Aerospace Engineer	GS-13/14	SPT	NASA-Wide	3-31-77
77-46	Communications Clerk (Typing) or Clerk-Typist	GS-4/5 or GS-3/4	AAC	Centerwide & Outside	3-18-77

TO APPLY: Call extension 5599 or 5600.

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-11	Personnel Clerk (Typing)	APM	Lisa Brown
77-31	Contract Specialist	ASA	Kenneth Gee
77-33	Contract Specialist	ASR	Miguel Sobremonte Richard Couture

Books surplused

The Life Sciences Library, building 239 (basement) is preparing to surplus books no longer needed in the library or division library collections.

Before instituting formal surplusing procedures, the staff wants to be certain that all local needs are being met; therefore, the items being surplused will be available for examination by Ames employees. They may select any title pertinent to their work for retention in offices or laboratories.

Stop by the Life Sciences Library B71 anytime beginning *Monday, March 14th*. The materials will be on display shelves in the hallway at the far end of the library outside Room B71.

Persons selecting materials are reminded that the material remains government property and may not be appropriated for addition to private libraries or collections.

Easy order form

The Easy Order Form for Office Supplies (ARC 579) has been revised and is now ready for distribution. This new form will be used starting March 1. Please note that several items have been eliminated, a few new items added, and the sequence of items have been changed. Each requestor should order by description rather than by number. Also, for easy reference when calling Inventory Control on status of items, a corresponding list of National Stock Numbers (NSN) has been printed on the reverse side of the form. This list includes the catalog page number for each item so that a complete specification of the item can be obtained by the requestor. A lot of time has been spent and constructive effort put forth to produce this new listing. Please use the form properly. Remember, items *not* filled will *not* be backordered. You must reorder items not filled within 15 days.

Photocopying temporarily ceases

Notice: The Main Library will no longer be able to offer photocopying service for articles in the library's collection. This service has been provided in the past by student assistants. There are no students working in the Library at present. Requests for photocopies must, unfortunately, be returned to the sender. The Life Sciences Branch Library has already discontinued the service for the same reason.

Future photocopy services will be contingent on availability of student help. We ask your indulgence until we are able to offer the service again.

Want ads

Transportation

1961 VW Bug, Running Condition. Call after 6 p.m. 851-2693, $350.

- - - - -

1972 Fiat 124 Spider Convertible, new top and battery, AM/FM, good tires, a clean, well-mothered car. $2860. Call Bill at 965-6467.

- - - - -

1976 Triumph TR7, beautiful condition, Moon Roof, AM/FM 8 Track, Mags, Custom Stripe, Only 17,000 miles, Transferable 50,000 mile warranty, current Blue Book price $6650, Asking $5850. Will take partial trade. 961-9452.

- - - - -

1970 Chevrolet Impala Custom Coupe. AC, PS, PB, Automatic. $1000 or Best Offer. Call Dennis Cunningham, 255-7408.

- - - - -

1971 Ford Ranchero, 302 V8, AT, AC, PS, Protecto Top Bed Cover, Good Condition, $1900/offer, 948-5968.

1962 VW Bug with '65 engine, 4 new tires, runs. $350 or best offer. Please call 255-3648.

- - - - -

1973 Honda 90, 35 miles total. Phone 245-1810 after 5:30 p.m.

- - - - -

1973 Ford LTD Braughm. Excellent condition. $2100. Call 257-1921 after 5:30 p.m.

- - - - -

1972 Honda CL 350. 4000 miles in excellent condition. Asking $510. Call evenings after 6:00, 267-3012 and ask for John.

Housing

FOR RENT: Large Duplex, 3 bedroom, 2 bath, utility room. Springer Ave, in Mt. View, 948-3475.

- - - - -

Ski or walk to Alpine Meadows lifts. Plush 3 Br. condominium sleeps up to 10. AEK, DW, Washer & Dryer, fireplace, heated parking pad. Dramatic view of backside of KT-22 from balcony. Reserve now. By day or week, 736-1357.

- - - - -

Squaw Valley Rental— Skiing with no traffic headaches. Fully furnished Condo. Sleeps 5. Three min. walk to lifts. Call Ray Savin, 964-2170.

- - - - -

FOR RENT: Secluded A-Frame at South Tahoe. By week ($150) or weekend ($75), 948-9301.

Miscellaneous

Moving sale: Queen-sized bedroom set, Child's bedroom set (Trundle Beds), Living Room and Dining Room Furniture, other miscellaneous household items. Call Janice at 247-5077 after 5 p.m.

- - - - -

FOR SALE: Ludwig Drums w/Zildjian Cymbals, 7 pieces, excellent condition, best offer. Call Mary, 246-5193 After 3:00 p.m.

- - - - -

1973 Bass Boat, Starcraft 16 foot, 65 H.P. Johnson, depth finder, water temp. G., anchor mate, surrey top, 2 gas tanks, 2 batteries, electric fishing motor, foot controled, 3 life jackets, fire exit, rod holders mounted for trolling, Trailer-Rite trailer with bearing buddies, 14 inch wheels, spare tire mounted on trailer with cover. Top condition. Asking $2400. Call Steve after 5:30, 258-1675.

- - - - -

FOR SALE: Sofa, chair, cof. table, end table set in Black vinyl, wrought iron frame, glass top tables. excellent condition. $150 or best offer. Also: 2 Danish Style chairs - wood frame and cushions - arm chairs. $25. 446-0208.

- - - - -

FOR SALE: Crib with mattress, also net play-pen. $50. A1C David Wimsett (Travis AFB) will bring down to area. Contact Mrs. Wimsett at Ames ext. 5734.

- - - - -

WANTED: Any extra license plate frames with "Ames Research Center, Moffett Field, CA" as ARA store said they do not stock them anymore. Contact Mrs. Wimsett at Ames ext. 5734.

- - - - -

Ladies Golf Clubs, 4 woods, $60, 9 irons $30, bag $10. Call 245-6757.

- - - - -

FOR SALE: Bunk/twin beds with two box springs and mattress. Also, one mattress in the top bunk, $75. One double bed mattress with box springs, $30. 967-5898.

- - - - -

San Francisco Symphony at Flint Center, Cupertino: Two tickets 6th row center orch. for Saturday eve, Apr. 2. $9.75 ea. L. Tobras 733-5737.

FOR SALE: Stereo Console; Packard Bell. 4-way 12" Speakers, Garrard Changer, 6-ft walnut Scandinavian design cabinet, beautiful sound and condition, 967-1353 after 5:00 p.m.

NASA
National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035
AC 415 965-5000

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NASA

The Astrogram

VOLUME XIX NUMBER 12 March 24, 1977

Infared Astronomy Satellite Project approved

The U.S. and Dutch Governments recently announced the approval of the Infrared Astronomy Satellite (IRAS) Project. IRAS is a cooperative U.S.-Netherlands-U.K. space project whose mission is to perform an infrared survey of the entire celestial sphere. The IRAS satellite consists of a spacecraft to be built by the Netherlands and a large cryogenically-cooled infrared telescope to be built by the U.S. Ames is responsible for the IRAS Telescope System. The overall U.S. Project Management is provided by JPL.

The IRAS is expected to produce a major new body of knowledge about the universe. The relatively new but rapidly growing science of infrared astronomy concentrates on the cool objects in space. IRAS will acquire fundamental scientific information about the origin and replenishment of interstellar matter, star formation, and the energy balance of molecular clouds, and may discover new classes of purely infrared objects.

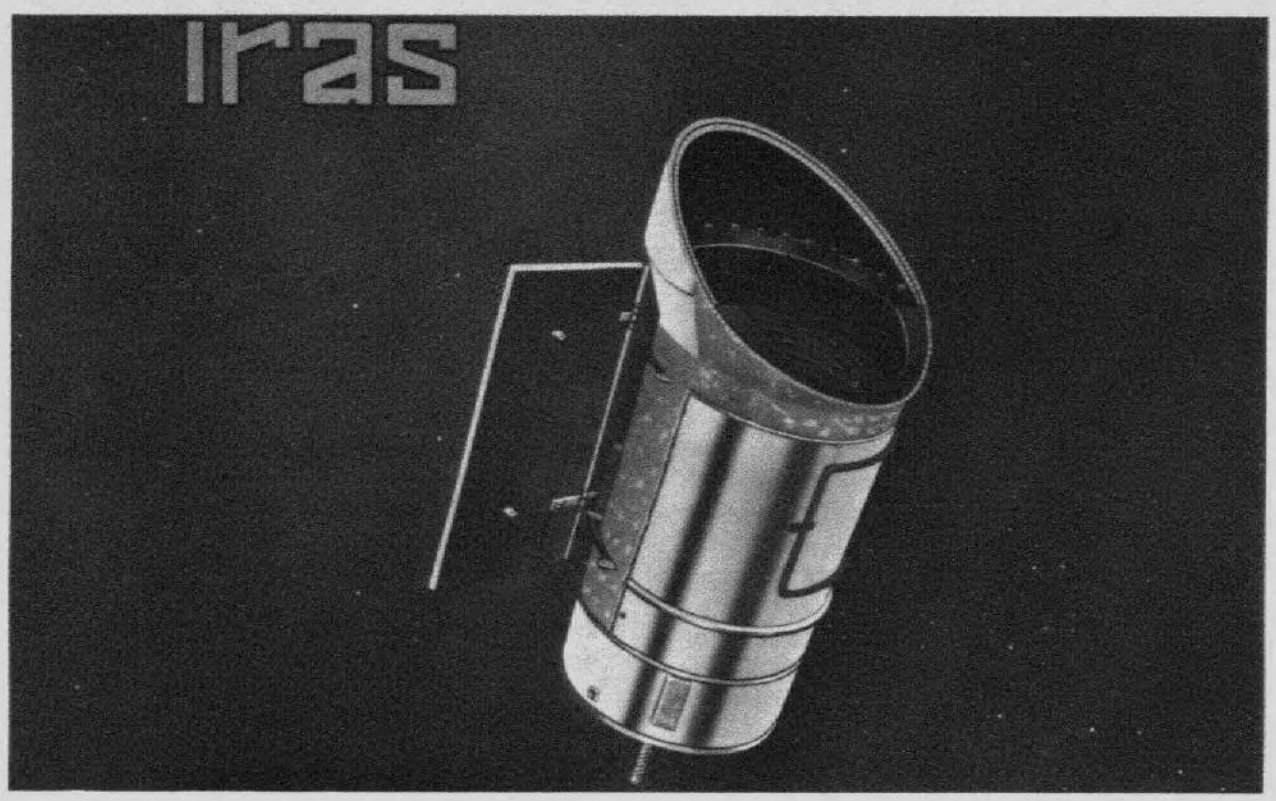
The Ames telescope, with an aperture of 60 cm, will be the largest cooled telescope ever flown. It will also be the first space instrument to use superfluid helium. The focal plane will contain about 60 IR detectors covering four wavelength bands from 8 microns to 120 microns. Also located at the focal plane will be a Low Resolution Spectrometer provided by scientists from the University of Groningen in the Netherlands, and a Long Wavelength Photometer provided by a group of British scientists.

The satellite will be launched into a sun-synchronous polar orbit from the Western Test Range in early 1981. During its one-year lifetime IRAS will perform two complete celestial surveys, with a sensitivity orders of magnitude greater than previously possible. To achieve this great sensitivity the entire telescope will be cooled below 20 Kelvin and the IR detectors at the focal plane will be maintained at 3 K. Superfluid helium at about 2 K will be used as the coolant.

Water vapor in the earth's atmosphere absorbs infrared radiation and thus prevents earth-based astronomical observation in all but a few narrow IR "windows." The absence of any appreciable atmosphere at IRAS 900 Km altitude will allow unrestricted viewing throughout the infrared spectrum. In addition the lack of atmosphere permits cooling the telescope to cryogenic temperatures without problems from condensation and freezing of atmospheric constituents.

The total project is estimated to cost about 85 million dollars with the costs being shared about equally between the U.S. and the Netherlands. The Ames Telescope System is a significant fraction of the U.S. commitment.

The Telescope System will be built under Ames direction by a U.S. industrial firm selected through the competitive bidding process. Focal plane testing will be performed in-house at Ames. The IRAS spacecraft will be built by Fokker-VFW and Hollandse Signaal Apparaten of the Netherlands.



The Telescope System Project Office is contained within the Space Projects Division of the Astronautics Directorate and includes personnel from Space Sciences, R&QA and Procurement. The Telescope System Manager is Tom Harmount and the Deputy Project Scientist is Dr. Russ Walker.

Uranus rings sighted

Rings appear to be circling the remote planet Uranus, a finding that would make it the second planet in the solar system to have rings around it.

The discovery of what scientists believe are rings around Uranus means the magnificent rings of Saturn are no longer unique to the solar system of nine planets, a supposition treated as scientific fact since 1655 when Dutch astronomer Christian Huygens identified Saturn's rings for the first time.

At no time in the last 320 years had astronomers been able to locate a second planet with rings, because the light of the more remote planets like Uranus washes out anything else close to the planets and because the right conditions and instruments are only now available to observe details close to planets farther out than Saturn.

In what some astronomers described as a major breakthrough, three scientists from Cornell University found and observatories in Australia and India confirmed what the three say are rings of rock and ice around the equatorial belt of Uranus, the seventh planet out from the sun and 1.7 billion miles from earth.

So important is the finding that the Smithsonian Astronomical Observatory in Cambridge, Mass., sent telegrams yesterday to astronomers around the world suggesting where and how they look to duplicate the discovery. The Cornell team was as surprised by the discovery as everybody else in the astronomical community.

"We weren't looking for rings at all," said Cornell's Dr. James Elliott, leader of the team that included Drs. Edward Dunham and Douglas Mink. "What we were looking into was the atmospheric properties of the planet itself, to see if we could read its composition and temperature."

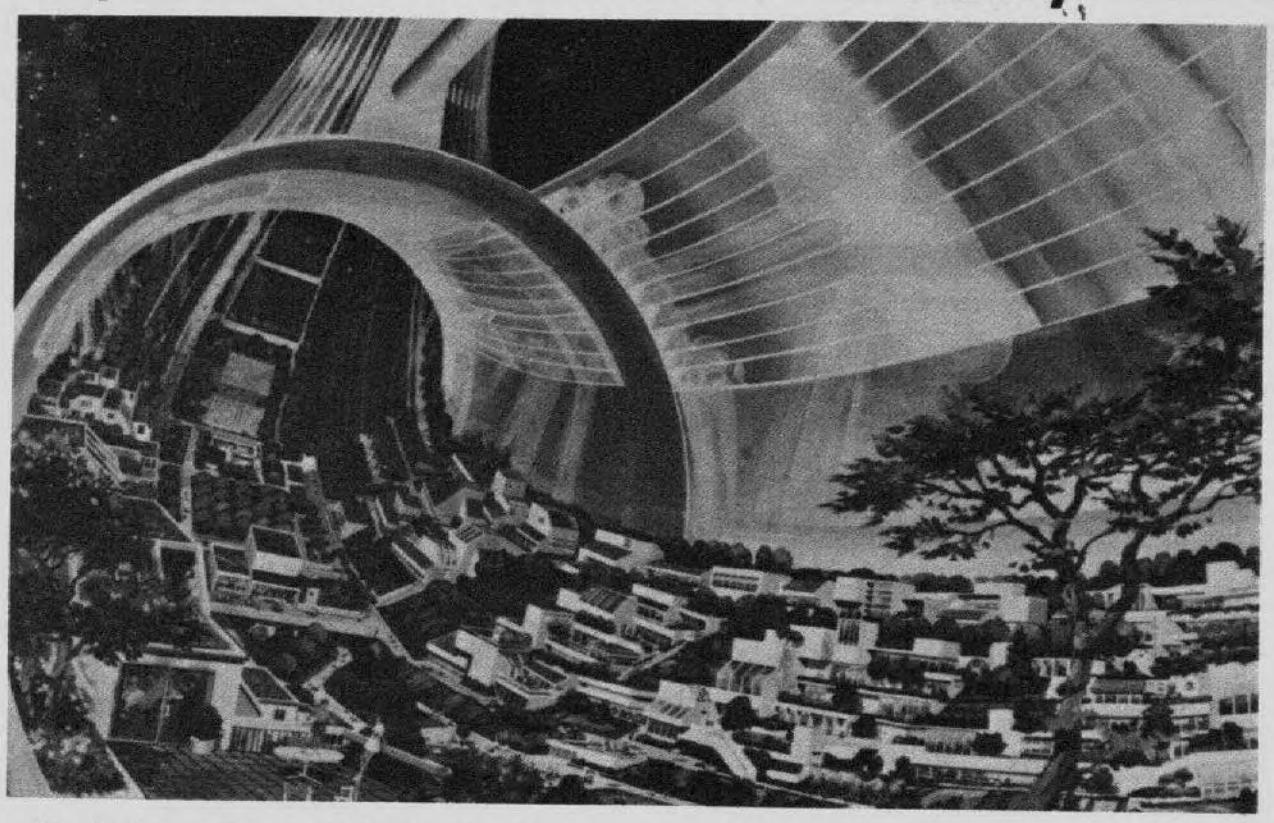
Flying in the space agency's C-141 "Airborne Observatory" east of Australia on March 10, the Cornell astronomers aimed the aircraft's 36-inch telescope at Uranus, which on that night was passing in front of a distant star in the Constellation Libra that does not have a name. Its catalogue number is SAO-158687, the SAO standing for Smithsonian Astronomical Observatory.

In the nine minutes before Uranus completely blocked out the star's light and in the nine minutes after, the telescope lost sight of the star for periods of about eight seconds at 10 different times. Five times it lost the star before the planet blocked it out and five times it lost the star after the star emerged on the other side of the planet.

Uranus has five known moons, none of which could have caused the 10 blackouts. The moon closest to the planet lies about 160,000 miles out from the planet and the blackouts took place about 27,000 miles from the planet on either side of the planet.

"I think we were looking through a very faint ring system similar to the rings of Saturn," Elliott said yesterday from his office at Cornell. The fact that there were five blackouts on either side of the planet suggests rings and not moons, since moons would have been placed around the planet in a more random way."

"Space Settlement" Study



The 1977 Ames Summer Study promises to be an extremely interesting one on the topic of "Space Settlements and Industrialization Using Non-Terrestrial Materials." The study will extend from June 22nd to August 2nd and will be the third summer Ames has participated in this topic. Some of the study topics include the following:

Closed Ecological Systems:

Regenerative life support systems pose some of the most serious design requirements for space settlements. Variables such as cost, total size, number and types of species, length of the food chains, and degree of closure will be considered. This detailed examination of ecological design requirements and their solutions will be incorporated into a long range plan for R&D activities in this area.

Environmental Parameters:

This study will examine the impact on habitat design of departing from Earth-ideal human requirements. Within certain limits, human beings can adapt well to changes in environmental characteristics; these adaptations are physiological, behavioral and sociological. A corresponding modification in the specifications for environmental parameters might lead to designs perhaps less costly and more reliable than normal terrestrial conditions.

Asteroid Resources:

An investigation of search techniques, remote compositional analysis, orbit determination, and retrieval modes for low velocity increment (relative to Earth) asteroids will be performed. Emphasis will be on the study of optimized transfer of asteroids to Earth parking orbits. Cost effectiveness will be determined relative to asteroid orbit, ΔV, transfer time, asteroid mass, recovered mass, asteroid composition, and mission opportunity.

Mass Driver Technology:

This study will define the potential of the electromagnetic mass driver as a propulsion system. It will examine the technical and economic feasibility of employing the mass driver concept in a variety of missions and applications, including its use as: lunar tug, orbit-to-orbit transfer, asteroidal tug, station keeping and control, and as a material launching system. Overall technology needs, as well as those peculiar to a given mission, will be defined. The economics of a given application will be compared to those of conventional propulsion systems.

Non-terrestrial Material Extraction and Construction:

A zero-based approach to the development of non-terrestrial resources will be pursued from discovery through structural component manufacturing. The study will identify and assess processes tailored to the unique conditions of space: gravity, vacuum, energy availability, etc. The economics of developing non-terrestrial resources will be compared to that of Earth resources for various missions and applications.

Dr. John Billingham is the chief of the Space Settlement Study Team and Bill Gilbreath is the project scientist of the team. The study is funded by NASA Headquarters and coordinated by Ben Zeitman. For further information people may contact Zeitman at extension 5989, mail stop 204-2.

It should be noted that on April 1st Dr. Gerard O'Neill will be at Ames to speak on "Electromagnetic Propulsion Systems." Watch for the flyer announcement.

Dr. Fletcher resigns

Dr. James C. Fletcher today announced that he has submitted his resignation as Administrator of the National Aeronautics and Space Administration (NASA) effective May 1. He plans to return to private life after that date.

Dr. Fletcher was appointed Administrator of NASA on April 27. Since that time he has led our nation's space and aeronautics effort to the successful completion of the Apollo program, through the Skylab and Apollo-Soyuz and the now almost operational Landsat programs. Most recently NASA completed the two universally acclaimed Viking landings on Mars and the initial tests of the first Space Shuttle Orbiter.

Prior to joining NASA, he had been a research physicist, professor, businessman and university president.

Kubokawa's candidacy

Charles "Chuck" Kubokawa, Chief of the Technology Utilization Office, has announced his candidacy for the Palo Alto City Council. The Palo Alto City election will be held on Tuesday, May 10, 1977. Originally, 18 candidates registered to vie for the 5 council seats, but 1 candidate has already dropped out.

The city council positions are nonpartisan and nonpolitical, therefore, federal employees are allowed to run for such offices under the ruling of the Hatch Act.

AAS conference set

A call-for-papers has been issued by the American Astronautical Society (AAS) for its 23rd annual meeting. General theme of the conference is "The Industrialization of Space – Planning for Profit at the High Frontier."

Set for October 18–20 at the Airport Hilton Hotel in San Francisco, the AAS meeting is being co-sponsored by the American Institute of Aeronautics and Astronautics (AIAA), the Institute of Electrical and Electronics Engineers (IEEE), the British Interplanetary Society, the International Institute of Space Law, the American Society for Quality Control, Stanford Research Institute, the L-5 (space colony) Society, and the National Space Institute.

The conference will focus on commercial activities in space over the next decade, with papers invited on such subjects as large manned or unmanned space structures, manufacturing in space, planning space communities (including psychosocial considerations), space law, and the economic realities of industrializing and colonizing space.

Abstracts of 200 to 500 words, or requests for more information, should be sent for consideration before May 1 to Technical Program Chairman Paul L. Siegler, Earth/Space, Inc., 4151 Middlefield Rd., Palo Alto, Calif. 94303; telephone: (415) 494-8339. Authors will be notified of acceptance by June 1, and final manuscripts will be due by September 1.

H. Julian Allen Award

The H. Julian Allen Award was established in 1969 to recognize outstanding scientific and engineering papers authored by members of the Ames Staff. Each year the award is presented along with an honorarium of $1,000 for the paper judged best by the award committee.

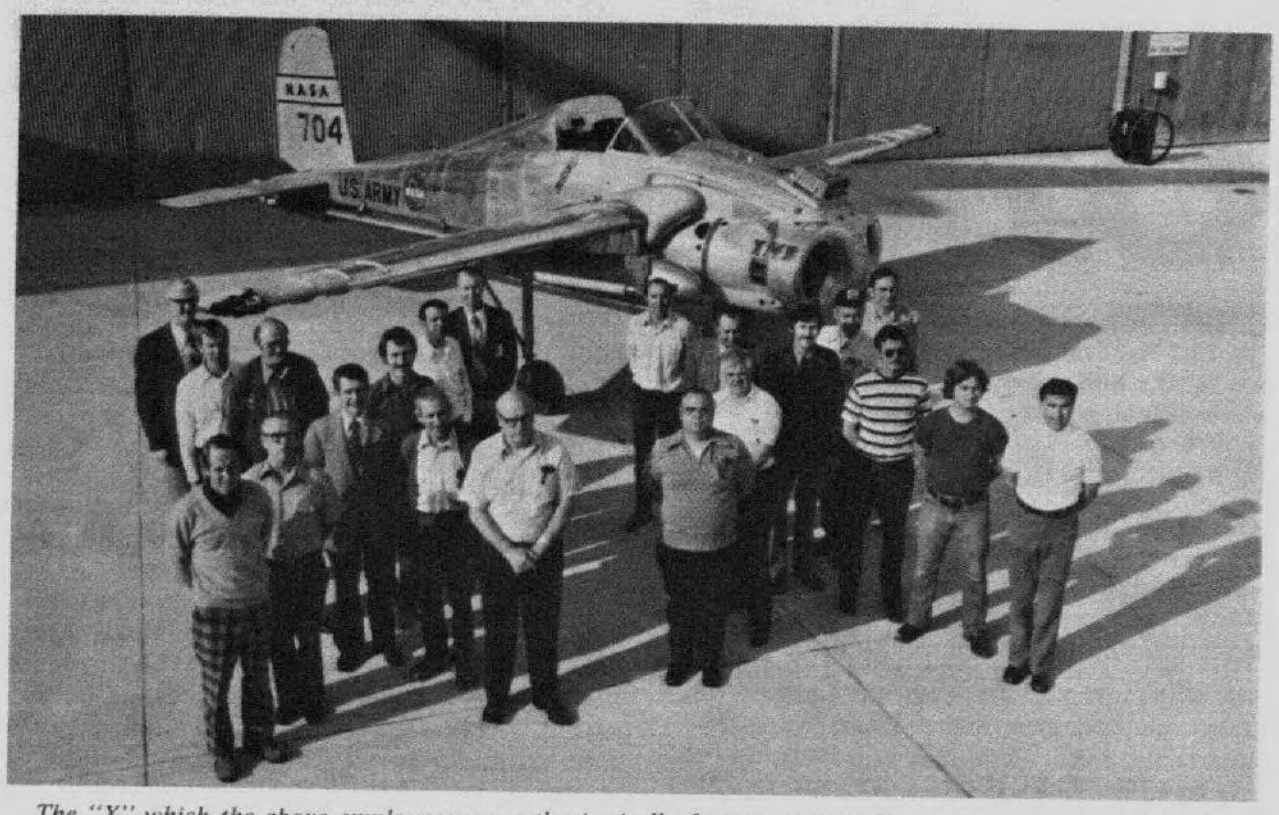
Dr. Mark has announced that the 1977 H. Julian Allen Award will be presented to Dr. F. R. Bailey and Dr. W. F. Ballhaus for the paper entitled, "Comparisons of Computed and Experimental Pressures for Transonic Flows About Isolated Wings and Wing-Fuselage Configurations". Dr. Bailey is a member of the staff of the Ames Research Center, and Dr. Ballhaus is a member of the staff of U.S. Army Air Mobility Research and Development Laboratory located at Ames.

The award and the honorarium will be presented to the winners in conjunction with a presentation of the paper to the Center Staff scheduled for April 8, at 3:30 p.m., in the Auditorium, N-201.

Explorer advisor wanted

Teenage group of explorer scouts needs adult advisor to work with them two evenings a month. Meetings are held at Ames and usually consist of 10-15 high school age children. The prime purpose of the organization is to promote the field of aeronautics as a career to teenagers. The Explorer Post is sponsored by NASA and Ames.

X-14 celebrates 20th birthday



The "X" which the above employees are enthusiastically forming include (from back row left to right) Frank Pauli, Seth Anderson, Dave Walton, Terry Fiestel; next "row?": Dan Dugan, Jim Rogers, Ed Vernon, Lee Jones; next: Cy Sewell, Dick Greif, Lloyd Corliss; next: Ron Gerdes, Dick Gallant, Terry Stoeffler; next: Bill Carpenter, Sid Selan, Lonnie Phillips, Jim Kozloaski; front row: Fred Drinkwater, Jim Meek and Vic Bravo; not pictured: Terry Gossett, Bob Innis, Stu Rolls and Lawson Williamson.

AIRPLANES HAVE BIRTHDAYS, TOO! . . . NASA's venerable X-14 research aircraft, the first jet-propelled airplane able to combine conventional flight with vertical takeoffs and landings, celebrated its 20th birthday in February. It has been noted (tongue in cheek), by Code FSD's branch triviologist Dick Greif, that a year in the life of a VTOL is equivalent to 14.42 years of human life. This would place the X-14's effective age somewhere around 288 years. To mark the momentous occasion, many of the X-14's old acquaintances gathered for a group photo. Among those notably absent from this affair were Terry Gossett, Bob Innis, Stu Rolls and Lawson Williamson. Following the photo session, a brief reception was held with cake and *plain* talk. The birthday cake for this occasion was decorated by Jane and Troy Corliss (wife and son of the present project engineer).

Over the years the X-14 has been used in numerous VTOL and STOL programs and has been flown by many foreign and "domestic" pilots, including Neil Armstrong who flew it as a lunar lander. The plane has had two variable stability systems and 3 different sets of engines installed in it and has been used as a test bed for the study of much gadgetry over the years. These devices have included a side force vane, fans on the wing tips, mechanically stabilized reaction nozzles, and wing span extension booms. Presently, the X-14B is configured as an in-flight simulator with a digital model following control system for the study of in-hover control concepts. For this phase of the research the project pilot is Ron Gerdes.

Safety corner

During December, an Air Force officer was helping a friend start his car with jump cables. The procedure he used was to connect the positive terminal of the dead battery to the positive of the charged battery. He then connected the jumper cable to the negative terminal of the dead battery and to the negative of the charged battery. The last step resulted in arcing and as a result the dead battery exploded. The top half of the battery became propelled shrapnel of which pieces were found 100 feet from the explosion. The officer was very fortunate in that only one eye was injured. He could have very easily lost the use of both eyes.

For this reason, the correct procedures are being brought to everyone's attention again.

The correct procedure is:

STEP 1 – Red cable to the positive (+) of the charged battery.

STEP 2 – Red cable to the positive (+) of the dead battery.

STEP 3 – Black cable to the negative (–) of the charged battery.

STEP 4 – Black cable to some metal portion of the dead engine or car frame away from the battery, but *not* on the negative terminal of the discharged battery.

Reverse the procedure when removing cables.

ARA ACTIVITIES

ARA STORE- The ARA Store will be closed for inventory, March 31, 1977.

ICE FOLLIES- Tickets for the Ice Follies will be for sale at $6.00 for a $7.00 ticket for the May 28th, 4:00 p.m. performance at the Oakland Coliseum. Tickets will be available at the ARA Store sometime in early May. Watch for an ARA Bulletin announcing their availability.

HAPPY HOUR- The next Happy Hour will be Friday, April 1st sponsored by the Ames Fastpitch Softball Teams.

Display

COMING TO AMES, WEDNESDAY APRIL 6th

Laboratory Equipment Display

Bldg. N-241, Procurement
Conference Room (2nd flr)
1000 to 1500 hours

Coffee and Doughnuts

VWR Scientific

Women engineers

The Society of Women Engineers will have a dinner meeting Wednesday, April 6, 1977 at Dinah's Shack in Palo Alto on El Camino. Our speaker will be Dr. Helen Quinn, an Associate Professor in Physics at Harvard University, who is visiting at Stanford. Dr. Quinn's presentation will be on Particle Physics.

5:30–6:30 p.m. – No Host Cocktails
6:30–7:30 p.m. – Dinner
7:30–9:30 p.m. – Business Meeting and Speaker

The meeting is open to the public and I invite you to participate. For more information or to make reservations contact me – Sharon Okonski, at extension 6625.

Cogswell classes

Cogswell College, an accredited engineering technological college based in San Francisco, is now offering upper division electronics technological courses at the Cogswell College Santa Clara Valley Education Center at Fairchild in Mountain View. Cogswell College offers a BS degree in Electronics Technology. All classes at the Center are offered at convenient evening and Saturday hours. Instructors at the Center are drawn from the ranks of industry and academia. Cogswell College plans to provide college-level programs designed to meet current and emerging needs of science, business and industry.

Courses in the following areas will be offered this spring in Mountain View:

ET 343 – Linear IC Applications
ET 422 – Microwaves
ET 362 – Digital IC Applications
ET 423 – Antenna Theory
ET 452 – Microprocessors and Applications
ET 453 – Microcomputer Programming
ET 499 – Laser Technology: An Overview for Nonspecialists
Math 360 – Numerical Analysis
Bus 410 – Business Law
Engl 221 – Interpersonal Communication
Engl 410 – Advanced Technical Communication
ST 461 – Safety Management
Sci 299 – Seamanship for Scientists and Technologists
CT 499 – Solar Energy Applications

Tuition: Per unit–$45. Late registration fee–$10.

For further course descriptions please check the rack outside the Training Office (Bldg. 241, Room 138).

Scuba club

Are you an underwater freak looking for a home? Why not join the Ames Scuba Club?

The club is open to all present and retired employees of Ames, support contractors with permanent ARC contract badges, research fellows, and military personnel whose primary place of duty is Ames Research Center, as well as the immediate families of such eligible personnel.

The club owns a considerable amount of scuba equipment, which is available to all certified members. The equipment includes tanks, backpacks, regulators, submersible pressure guages, weights and weightbelts, surf mats and an inflatable boat. In addition, the club has access to an air station to fill tanks for the members.

Meetings are held on the second Wednesday of each month at 12:45 p.m. in the Executive Dining Room of the Ames Cafeteria. Dues are $5.00 per year.

So if you have an interest in diving, why not come to our next meeting and see what the Ames Scuba Club does underwater. You might like it!

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
77-43	Engineering Technician	GS-5/7/9	FSV	Centerwide & outside	4-1-77
77-47	Secretary (typing)	GS-4/5	LR	Centerwide	4-1-77

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
77-37	Personnel Clerk (typing)	APX	Linda Marshall

Want ads

Transportation

Wanted: Datsun, Toyota or Dasher 4-door wagon in good condition. 257-0583.

1976 Triumph TR7, beautiful cond., Moon Roof, AM/FM 8 Track, Mags, Custom Stripe, Only 17,000 miles, transferable 50,000 mile warranty, current Blue Book price $6650, Asking $5850. Will take partial trade. 961-9452

1976 Datsun B-210. Excellent running condition, new tires. Asking $2700/or best offer. Please call after 5:30, 259-7158.

1972 Mustang 302-V8, PS, AT, Excellent cond., $1900, 259-7419 evenings.

1974 Honda Civic in xlnt cond. Silver, Beige interior with cloth seats, AM radio, Cibie driving lights, almost brand new Michelins, 34K mi., Shop Manual included. $2100/B.O. 969-2265, after 6:00 weekdays, Ask for Hawkeye Madrid or The Contract Kid.

1972 Ford Country Sedan Wagon - 9 pass., 351 V8, AC, PS, AT, PDB, $1850. 266-8411.

Honda CL175 (73-74) Excellent condition, low mile age, still original equip. Asking $450. Call 984-2753 after 5:30.

For Sale: 1974 Huskey 250 WR, 2,000 mi., freeway legal or strip for dirt competition, near new condition, never raced. $800. Call 356-6849 after 5 pm.

1974 Audi Fox, good condition, AM/FM, 4 speed, 4 dr., $2700; offer. Ames x 6170 or 965-2834 evenings.

For Sale: '72 Toyota Corolla Deluxe, Exlnt. Cond., Radial Tires, AM/FM, 25 MPG. $1900. After 6 pm, call Sally, 326-9850.

For Sale: 1934 Chevrolet Deluxe Motor Coupe, Fully restored to original condition. New rebuilt engine, new mohair interior. $4,800/best offer. (408) 259-7158 after 5:30.

1971 VW Camper, newly rebuilt engine, factory air conditioning, fully equipped with camping gear. Must sell by March 27. $2150. Call Kevin Donohoe at Ames x 5737.

Housing

FOR RENT: Apartment - Old Palo Alto, Univ. Ave. Lux. 2 Br. 2 Ba., AEK, dshwr., 2 decks, wooded, quiet, undgrd. parking. $350/mo. 493-9406.

FOR RENT: House in Saratoga - West Gate Area. 3 Br. 1 1/2 Ba., Fam. Rm., Fireplace, Fully Carpeted, 1800 sq. ft., AEK w/built-in BBQ, lots of paneling, detached 2-car gar., close to all schools, incl. West Valley College, and near Ames Bus Serv. $550/mo with a $525 deposit. Call 354-6171.

FOR RENT: Beach house at Pajaro Dunes, completely furnished, cleaning included in the rent, beautiful views of Monterey Bay. See picture on bulletin board in Cafeteria. Reserve now for Fall weekends. Call John Lundell, 252-7260.

FOR RENT: By weekend or month a new condominium on levee near Bethel Island and Franks Tract in the Delta. Water Skiing, fishing, boating unlimited. Furnished sleeps 6, covered 25 foot berth. Call (408)356-6849.

FOR LEASE: House $410.00 mo, 3 Br. 2 Ba., 2 car gar., covered patio, water softener, stove, dishwasher, carpets, drapes, and fruit trees; Cherry Chase area 10 min. to Moffett, Call Walter Reese 245-5120.

FOR RENT: Eichler, immac. 4 Br. 2 Ba., fam. rm., 2 car gar., AEK, refrig, dshwshr, disp, new no-wax floors, new cpts and drps, lovely private yards, prime Palo Alto location, close to schools and Ames. Lse. $525 mo. Call 964-1725.

HOUSE FOR RENT: Sunnyvale 3 Br. 1 Ba., doub. gar., fireplace, large backyard w/patio, barcecue pit, Fruit trees, appliances, 3 miles to NASA. $360 mo. Avail 5/1. Call 248-9733.

FOR LEASE: House, 3 Br. 2 Ba., 2 Car gar., exlnt. area, Parkside, San Mateo. Nr. schools, shops. $400/mo. After 6 p.m. call Ron 326-9850.

Miscellaneous

Lady Shick Beauty Mist hair rollers. $15. 227-8332.

Sofa Chair, Heavy duty drk. br. vinyl upolstry, like new, good looking, comfortable, relaxing, ideal for family room/den. Can be used in living room. $70. Call 964-1725.

Carpool: 7:30 a.m. to 4:00 p.m. Evergreen area; Quimby and White. Phone 238-3390

Carpool: Want someone to share with ride from Willow Glen area of San Jose 8:00 - 4:30. Nancy x 6497.

Carpool from Palo Alto Area of Oregon and Bayshore, to NASA. Share driving. Call Olin Campbell 968-3653.

Woven wood shade, new 33 1/2 x 70 1/2, Walnut, Rust, Terra Cotta, beige yarn $30.00, Antique Brass Lamp & Shade, Pedestal Shape, like new, $25.00, Matching corner unit consisting of two dressers and desk, antique gold, good condition $50.00, 268-2904 after 6:30 p.m.

FOR SALE: 35mm Range Finder LEICA M3 camera w/50mm F2 lens and Eveready case: $350. 35mm wide angle lens F3.5 w/optical finder for M3: $135. 85mm Portrait lens F2 w/view finder and case for M3: $125. Call J. Licursi (408)335-4878 after 5:00 p.m.

Dining chairs, set of 6, made of wood, drk. walnut color with heavy duty black Vinyl seats. Very impressive, excel. cond. $125. Call 964-1725.

Twin size blankets, like new, $10 each; bed covers, $5 each; bed sheets, $3 each; all in very good condition. Call 964-1725.

San Francisco Symphony at Flint Center, Cupertino. Two tickets, 6th row center orch, for Sat. eve. Apr. 2. $9.75/ticket. L. Tobias 733-5737.

FOR SALE: Dark-green recliner - $80; AM/FM Stereo Panasonic receiver - $65; super 8mm film editor and splicer-$35; 321-2789 between 10-11 pm.

MOVING SALE: Extra High Quality Furniture: Bedroom Suite: American of Martinville Renaissance Continental Design, 5 pieces including 2 night stands, headboard, large dresser with 2 mirrors, highboy, also Beauty Rest mattress and box springs. Oriental: Chinese Modern living room furniture: 3 piece sectional-custom made, 1 large lamp, 2 chairs, rectangular wall picture; unique. Furniture has ebony trim. Very unusual but pretty. Love Seats: Early American birch, floral pattern, rocker. Also a lime oak; green Naugahyde. Antique rocker and maple rocker. Antique highboy with secretary. Gas power mower. Miscellaneous. Call 293-3559 evenings or weekends. All like new.

FOR SALE: 4 Kelley-Springfield Prestige Radials HR78-14, less than 3,000 miles. $130. Bob Steinhauer, ext 5465.

FOR SALE: 9 x 12 Orange shag rug, 1 yr. old, excellent cond. $50. w/padding. 11 x 13 Black and White short shag 1 yr. old rug, excellent cond., $75. w/padding. 40 plus yards Gold shag carpeting, 2 yrs. old. $200. w/padding. 263-4418.

FOR SALE: Nikon lenses; telephoto 135mm f3.5, $150; wide angle 28mm f3.5, $150. 964-6330.

FOR SALE: Rocking chair, $25; mens 10 speed bike, $30; portable typewriter, $30. 964-6330.

FOR SALE: Audiophiles. Pioneer PL12D Manual Turntable 2 yr. old, perf. cond; w/base, dustcover, new Shure M91ED Cartridge $75 Call 965-9850 after 5pm.

Persian rug with pad, 9x12, pretty, colorful, like new. $150. Call 964-1725.

FOR SALE: Ludwig-Zildjian drum set with drum cases. Excellent condition. $600. Call Jeff Souder, 245-9260.

House Sitting Done: Have local references. Call Ken Bilski x 6001.

FOR SALE: Electric guitar, Gibson copy, acoustic as well as electric, beautiful appearance and tome. Gibson amplifier $150. Air lift shock absorbers, Monroe, fits Chrysler products, used one month. $30.00/best offer. 738-2948.

FOR SALE: Membership in K-35 Bonanza $3750. $6.00 per hr. dry, $30.00 per month. DME, ADF. AIP, Built-in oxygen, encoding ALT. Hangared at San Jose Airport. Contact Pete Wolfe 984-8557.

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